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SECTION 7A

MANUAL TRANSMISSION

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System :

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

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GENERAL DESCRIPTION

CONSTRUCTION AND SERVICING

The transmission provides five forward speeds and one reverse speed by means of three synchronizers and three shafts-input shaft, countershaft and reverse gear shaft. All forward gears are in constant mesh, and reverse uses a sliding idler gear arrangement.

The low speed synchronizer is mounted on counter shaft and engaged with counter shaft first gear or second gear, while the high speed synchronizer is done on input shaft and engaged with input shaft third gear or fourth gear.

The fifth speed synchronizer on input shaft is engaged with input shaft fifth gear mounted on the input shaft.

The double cone synchronizing mechanism is provided to 2nd gear synchromesh device for high performance of shifting to 2nd gear.

The countershaft turns the final gear and differential assembly, thereby turning the front drive shafts which are attached to the front wheels.

4WD model is equipped with transfer assembly on transmission being mated to right side of differential output in transmission.

For servicing, it is necessary to use genuine sealant or its equivalent on mating surfaces of transmission case which is made of aluminum. The case fastening bolts must be tightened to specified torque by means of torque wrench. It is also important that all parts are thoroughly cleaned with cleaning fluid and air dried before reassembling.

Further, care must be taken to adjust preload of counter shaft taper roller bearings. New synchronizer rings are prohibited from being lapped with respective gear cones by using lapping compound before they are assembled.

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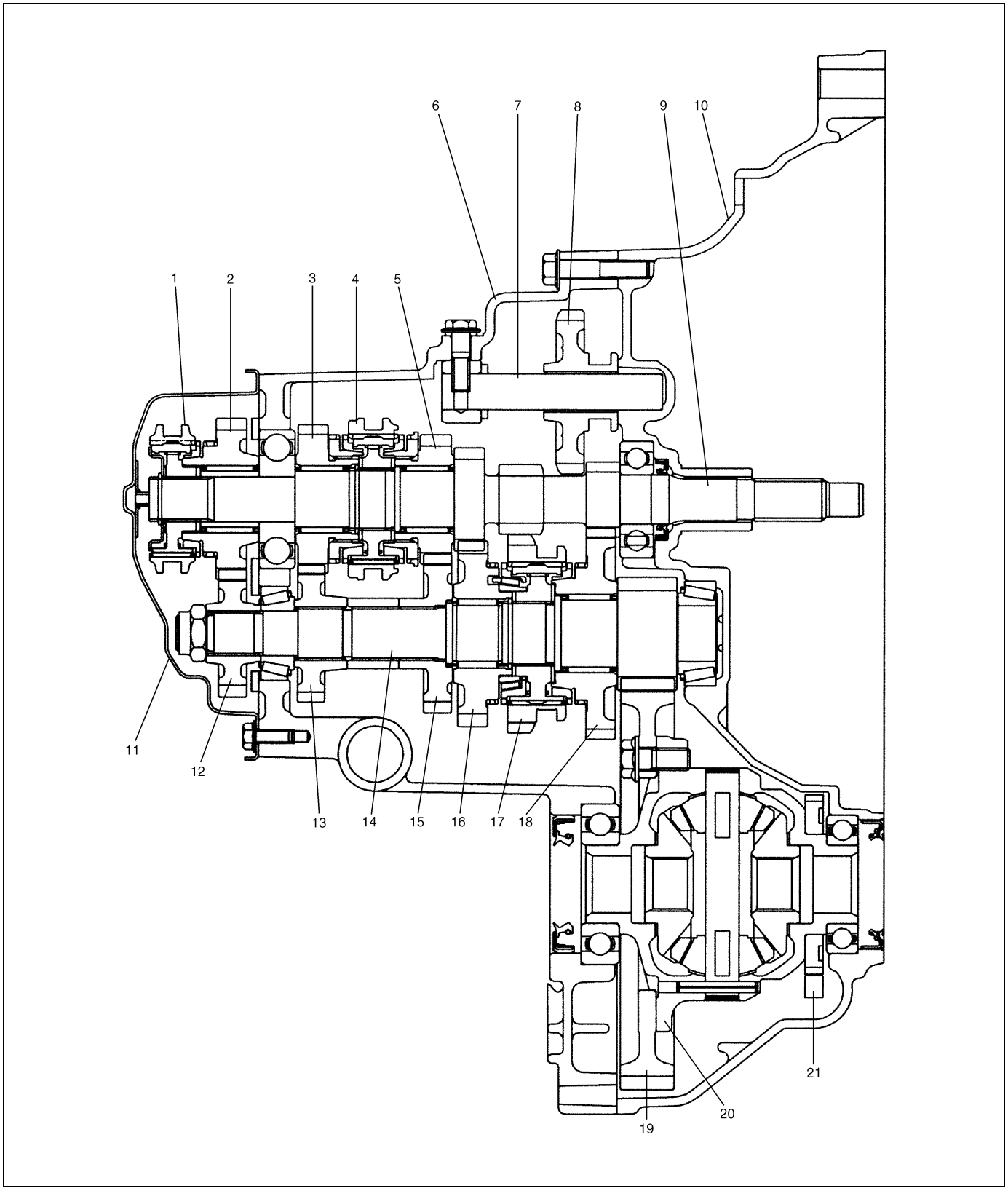
TRANSMISSION FOR 2WD MODEL



1. 5th speed sleeve & hub	8. Reverse idler gear	15. Countershaft 3rd gear
2. Input shaft 5th gear	9. Input shaft	16. Countershaft 2nd gear
3. Input shaft 4th gear	10. Right case	17. Low speed sleeve & hub
4. High speed sleeve & hub	11. Side cover	18. Countershaft 1st gear
5. Input shaft 3rd gear	12. Countershaft 5th gear	19. Final gear
6. Left case	13. Countershaft 4th gear	20. Differential case
7. Reverse gear shaft	14. Countershaft	21. Vehicle speed sensor

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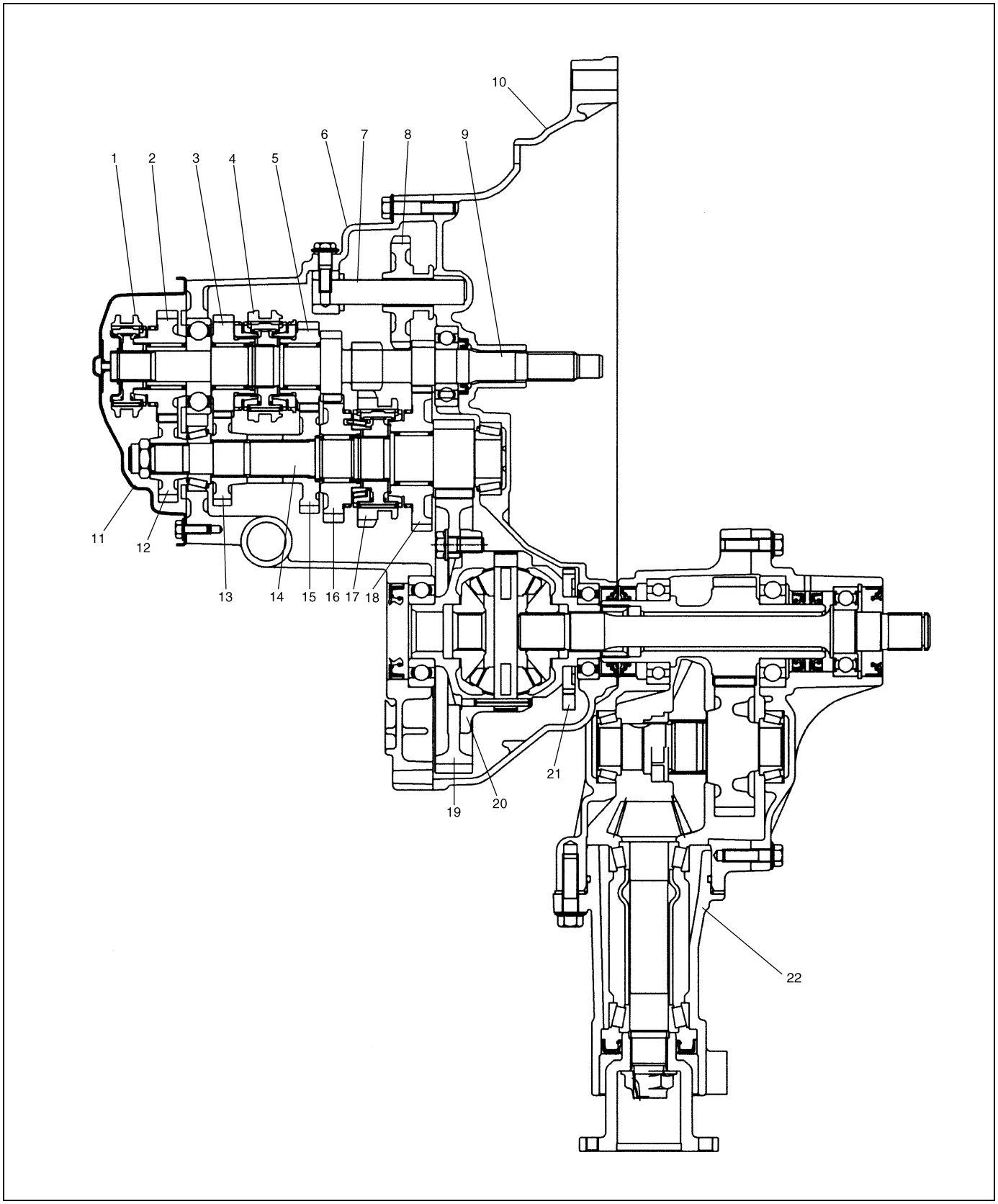
TRANSMISSION FOR 4WD MODEL



1. 5th speed sleeve & hub	7. Reverse gear shaft	13. Countershaft 4th gear	19. Final gear
2. Input shaft 5th gear	8. Reverse idler gear	14. Countershaft	20. Differential case
3. Input shaft 4th gear	9. Input shaft	15. Countershaft 3rd gear	21. Vehicle speed sensor
4. High speed sleeve & hub	10. Right case	16. Countershaft 2nd gear	22. Transfer assembly
5. Input shaft 3rd gear	11. Side cover	17. Low speed sleeve & hub	
6. Left case	12. Countershaft 5th gear	18. Countershaft 1st gear	

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DIAGNOSIS

Condition	Possible Cause	Correction
Gears slipping out of mesh	Maladjusted gear shift/select control cables	Adjust.
	Worn shift fork shaft	Replace.
	Worn shift fork or synchronizer sleeve	Replace.
	Weak or damaged locating springs	Replace.
	Worn bearings on input shaft or counter shaft	Replace.
	Worn chamfered tooth on sleeve and gear	Replace sleeve and gear.
Hard shifting	Maladjusted gear shift/select control cables	Adjust.
	Inadequate or insufficient lubricant	Replenish.
	Improper clutch pedal free travel	Adjust.
	Distorted or broken clutch disc	Replace.
	Damaged clutch pressure plate	Replace clutch cover.
	Worn synchronizer ring	Replace.
	Worn chamfered tooth on sleeve or gear	Replace sleeve or gear.
	Worn gear shift/select control cables joint	Replace.
	Distorted shift shaft	Replace.
Noise	Inadequate or insufficient lubricant	Replenish.
	Damaged or worn bearing(s)	Replace.
	Damaged or worn gear(s)	Replace.
	Damaged or worn synchronizer parts	Replace.

ON-VEHICLE SERVICE

CAUTION:

Do not reuse circlip, spring pin, E-ring, oil seal, gasket, self locking nut and specified parts. Reuse of it can result in trouble.

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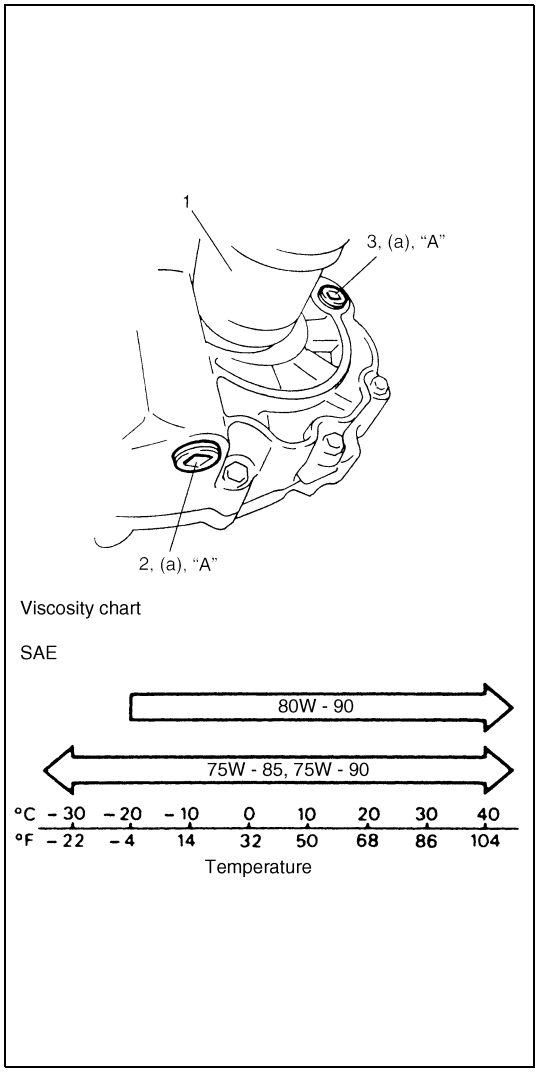
OIL CHANGE



1) Before changing or inspecting oil, be sure to stop engine and lift vehicle horizontally.
2) With vehicle lifted up, check oil level and leakage.
   If leakage exists, correct it.
3) Drain old oil and fill new specified oil by specified amount (up to level hole).
4) Apply sealant to thread of drain plug (2) and level/filler plug (3) and torque them as specified below.

"A" : Sealant 99000-31110

Tightening torque
Transmission oil level/filler and drain plugs
(a) : 21 N·m (2.1 kg-m, 15.5 lb-ft)

NOTE:

- **It is highly recommended to use API GL-4 75W-90 gear oil.**
- **Whenever vehicle is hoisted for any other service work than oil change, also be sure to check for oil leakage.**

Transmission oil
: API GL-4
For SAE classification, refer to viscosity chart in the figure.

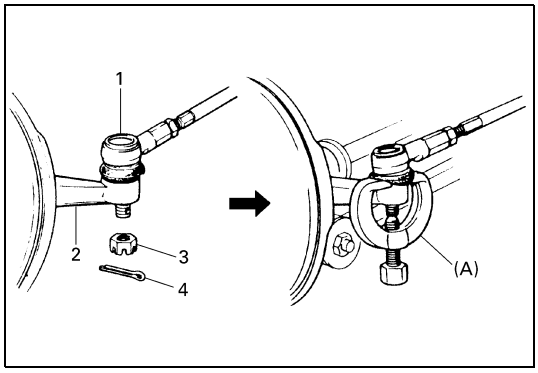
Transmission oil capacity
: 2.2 liters (4.6/3.9 US/Imp. pt)

1. Drive shaft (LH)

DIFFERENTIAL SIDE OIL SEAL

REPLACEMENT

1) Lift up vehicle and drain transmission oil.
2) Remove wheel, and then remove tie-rod end (1) split pin (4) and castle nut (3).
3) Disconnect tie-rod end from knuckle (2) by using special tool.



Special tool
(A) : 09913-65210

4) Remove two stabilizer mount brackets from vehicle body.
5) Remove ball stud bolt and then separate suspension arm from knuckle.
6) Separate transfer from transmission assembly. (for 4WD vehicle)
   For detail, refer to Section 7D.

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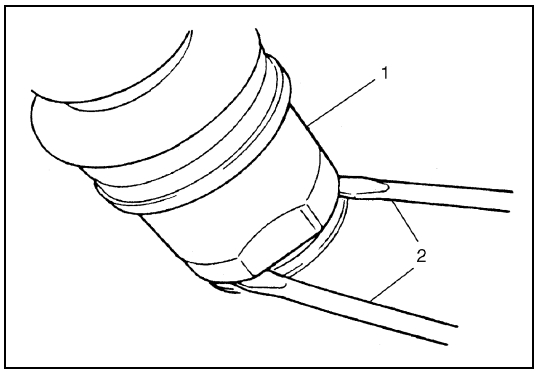
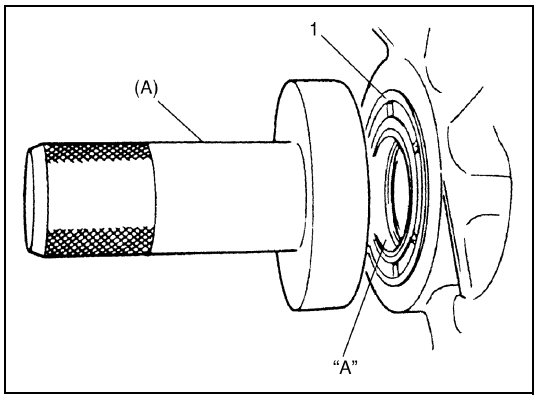


7) By using large size screwdrivers (2), pull out drive shaft joint (1) so as to release snap ring fitting of joint spline at differential side.Pushing knuckle portion outward, detach drive shaft at differential side.



8) Remove oil seal (1) and install a new one until it becomes flush with case surface by using special tool and hammer.

NOTE:

When installing oil seal, face its spring side inward.

Special tool
(A) : 09913-75510 (2WD and LH of 4WD)
(A) : 09951-46010 (RH of 4WD)

9) Apply grease to oil seal lip and at the same time check drive shaft where oil seal contacts and make sure of its smoothness.

"A" : Grease 99000-25010

10) Insert drive shaft joint to differential gear.

CAUTION:
- **Be careful not to scratch oil seal lip with drive shaft joint while inserting.**
- **Make sure to insert drive shaft joint fully and seat its snap ring as it was.**
- **Do not hit joint boot with hammer or the like. Nothing but hands is allowed to use when inserting joint.**

11) Connect ball stud with knuckle and fasten with bolt to specification referring to Section 3D.
12) Connect tie-rod end with knuckle and fasten new nut to specified torque referring to Section 3D.
13) Install stabilizer mount brackets, fasten bolts to specified torque referring to Section 3D.
14) Fill transmission oil as specified and make sure that oil has been sealed with oil seal.

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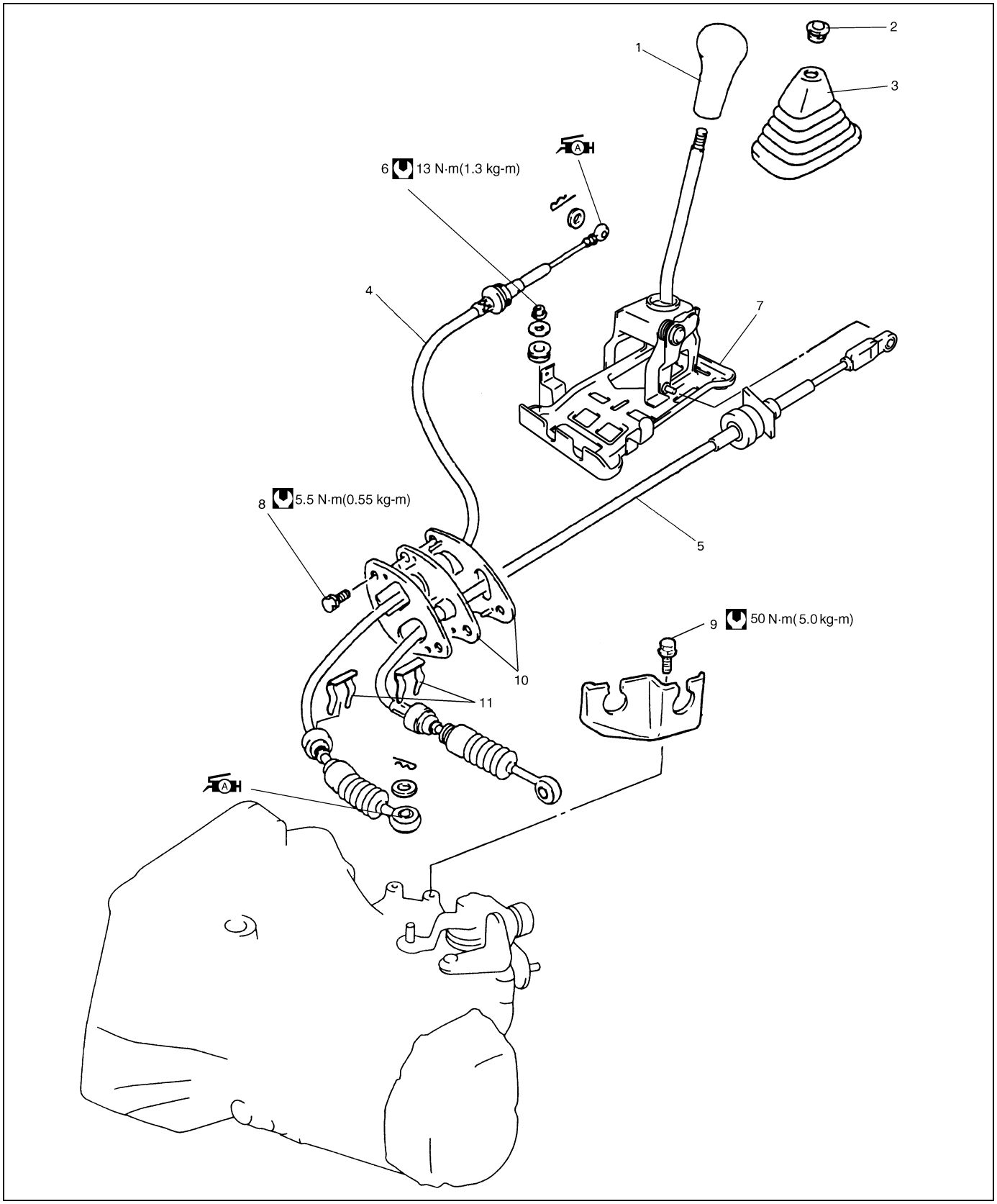
GEAR SHIFT CONTROL LEVER AND CABLE



	1. Gear shift control lever knob	5. Gear select control cable	9. Cable bracket bolt
	2. Lever boot holder	6. Gear shift control cable guide nut	10. Cable grommet
	3. Gear shift lever boot	7. Gear shift control lever assembly	11. E-ring
A H	4. Gear shift control cable : Apply SUZUKI SUPER GREASE A 99000-25010 to connecting portion of gear shift control cable	8. Cable mounting bolt	Tightening torque

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REMOVAL

1) Remove console box.
2) Disconnect gear shift and select control cables from gear shift control lever assembly.
3) Remove gear shift control cable guide nuts and gear shift lever assembly from body.
4) Disconnect shift and select cables from transmission.
5) Remove E-rings, cable grommet and cable clamp, and then remove shift and select cables from body.

INSTALLATION

Reverse removal procedure for installation and note as follows.

- Tighten each bolts and nuts to specified torque referring to previous figure.
- Apply grease to turning or sliding portions.

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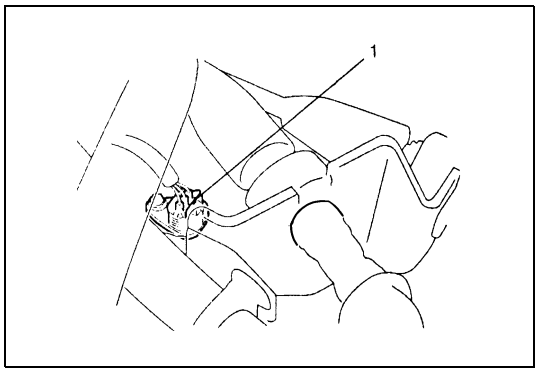
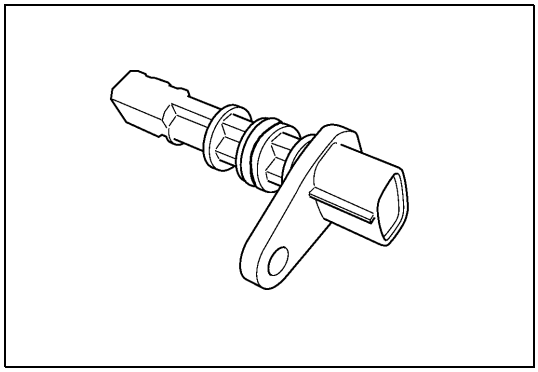
VEHICLE SPEED SENSOR (VSS)

REMOVAL

1) Disconnect negative cable at battery.

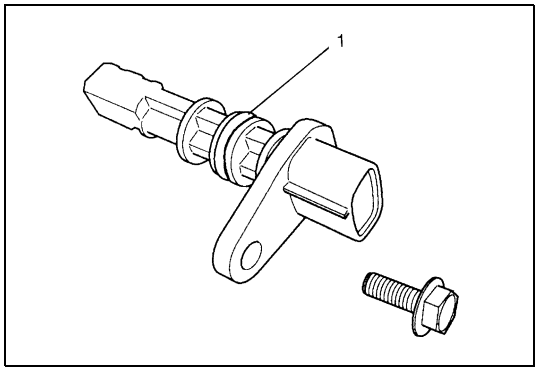


2) Disconnect VSS coupler (1).



3) Remove VSS.

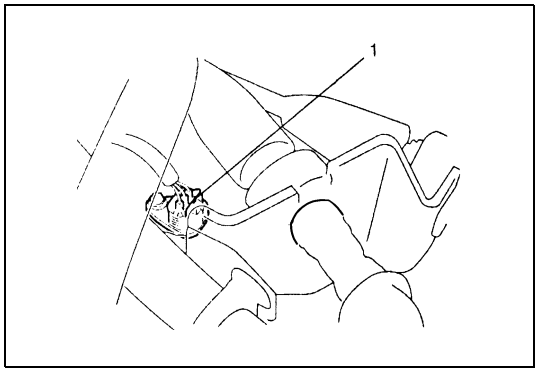
INSTALLATION



1) Check O-ring (1) and VSS surface for their flawlessness, apply grease to O-ring and then install VSS to transmission.

Grease 99000-25010

2) Connect negative cable at battery.



3) Connect VSS coupler (1).

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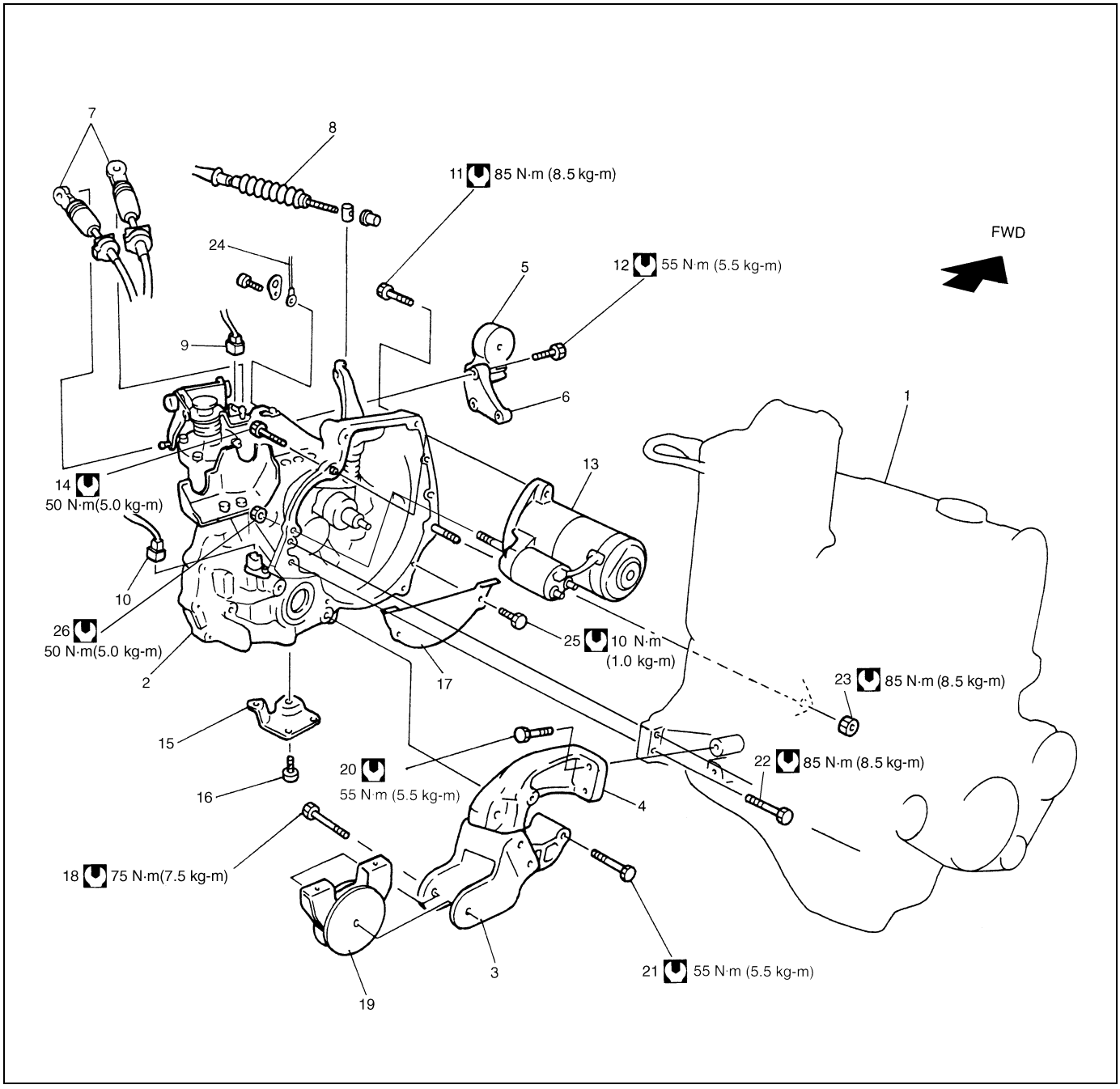
UNIT REPAIR OVERHAUL

TRANSMISSION UNIT



1. Engine	10. VSS connector	19. Engine rear mounting
2. Transmission	11. Transmission to engine bolts	20. Engine rear mounting No.2 bracket bolts
3. Engine rear mounting No.1 bracket	12. Engine left mounting bracket bolts	21. Transmission to engine rear mounting No.2 bracket bolt
4. Engine rear mounting No.2 bracket	13. Starting motor	22. Transmission to engine bolts
5. Engine left mounting	14. Starting motor bolt	23. Transmission to engine nut
6. Engine left mounting bracket	15. Engine rear mounting bracket stiffener	24. Ground cable
7. Shift & select control cables	16. Stiffener bolts	25. Clutch housing lower plate bolts
8. Clutch cable	17. Clutch housing lower plate	26. Starting motor nut
9. Backup lamp switch connector	18. Engine rear mounting bolt	Tightening torque

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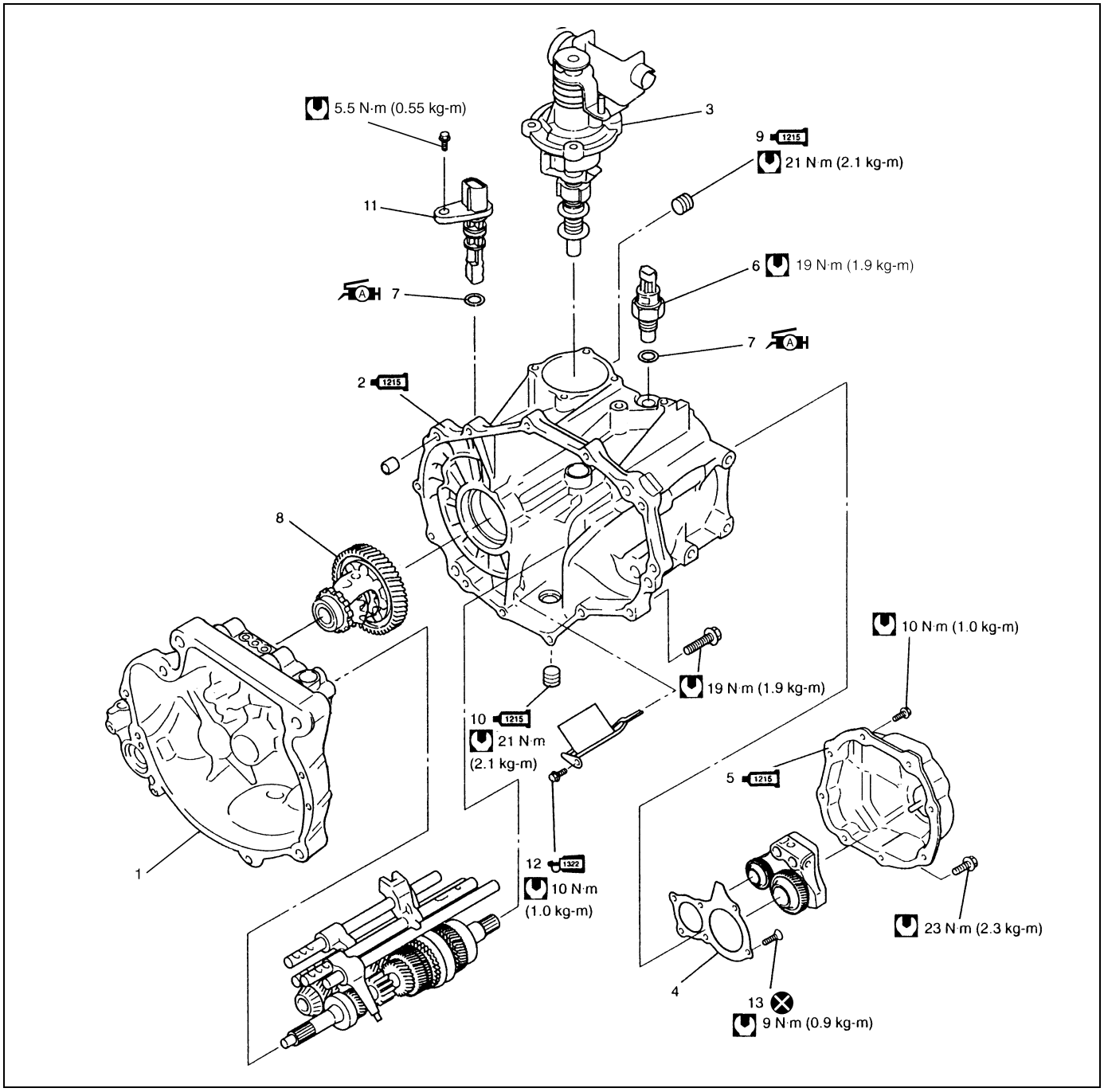
TRASMISSION CASE



	1. Transmission right case	1215	9. Oil level/filler plug : Apply sealant 99000-31110 to all around thread part of plug.
1215	2. Transmission left case : Apply sealant 99000-31110 to mating surface of left case and right case.	1215	10. Oil drain plug : Apply sealant 99000-31110 to all around thread part of plug.
	3. Gear shifter assembly		11. VSS
	4. Transmission left case plate	1322	12. Oil gutter bolt : Apply thread lock 99000-32110 to all around thread part of bolt.
1215	5. Transmission side cover : Apply sealant 99000-31110 to mating surface of side cover and left case.		13. Left case plate screw
	6. Backup lamp switch		Tightening torque
A H	7. O-ring : Apply SUZUKI SUPER GREASE A 99000-25010 to O-ring.		Do not reuse.
	8. Differential assembly		

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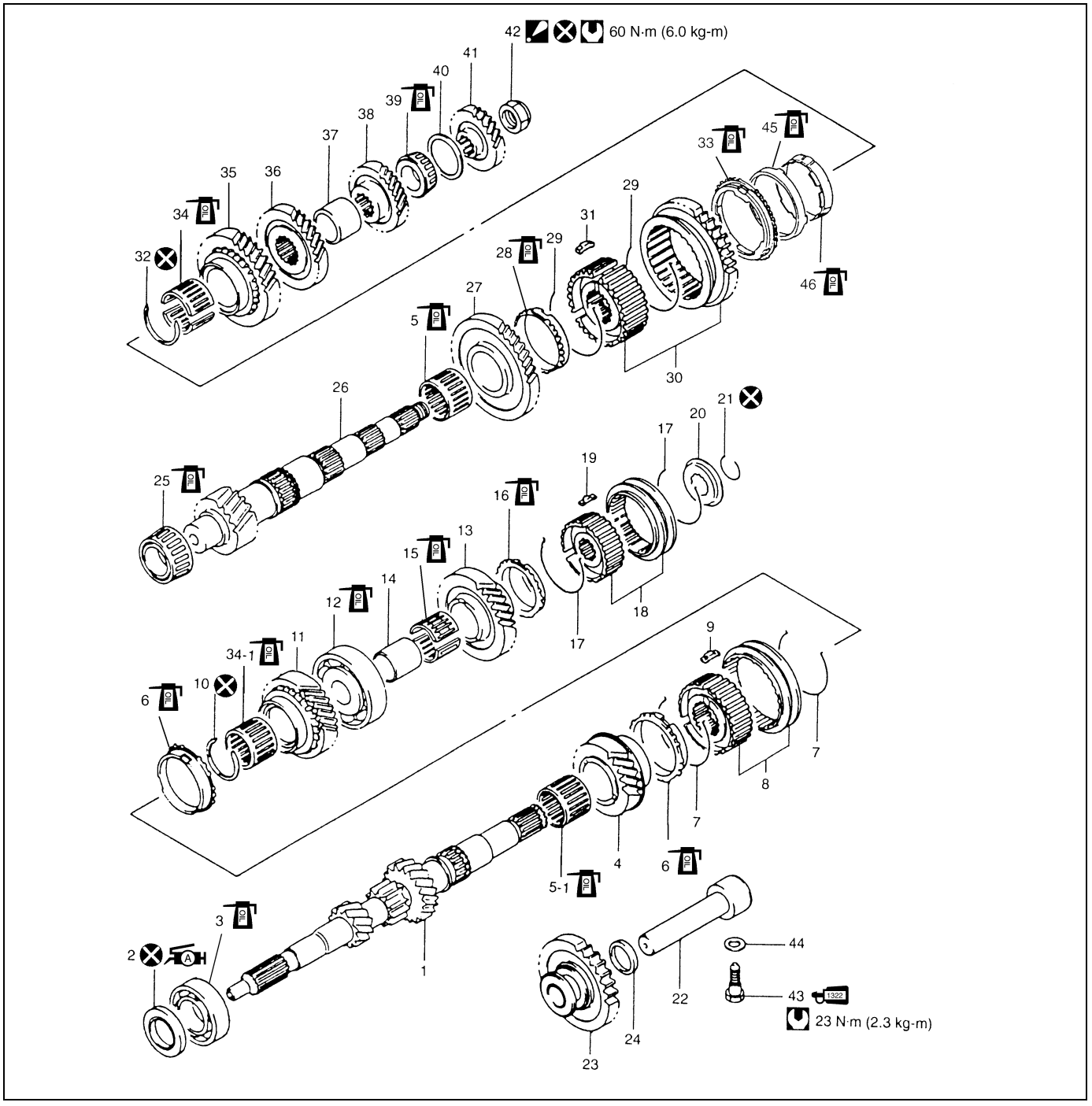
INPUT & COUNTER SHAFT



1. Input shaft	13. Input shaft 5th gear	26. Countershaft
2. Oil seal : Apply grease 99000-25010 to oil seal lip	14. 5th gear spacer	27. Countershaft 1st gear
3. Input shaft right bearing	15. 5th gear needle bearing (separated steel cage type)	28. 1st gear synchronizer ring
4. Input shaft 3rd gear	16. 5th speed synchronizer ring	29. Low speed synchronizer spring
5. Needle bearing (resin cage type)	17. 5th synchronizer spring	30. Low speed sleeve & hub
5-1. Needle bearing (resin cage type)	18. 5th speed sleeve & hub	31. Low speed synchronizer key
6. High speed synchronizer ring	19. 5th synchronizer key	32. Circlip
7. High speed synchronizer spring	20. 5th synchronizer hub plate	33. 2nd gear synchronizer outer ring
8. High speed sleeve & hub	21. Circlip	34. Needle bearing (separated steel cage type)
9. High speed synchronizer key	22. Reverse gear shaft	34-1. Needle bearing (steel cage type)
10. Circlip	23. Reverse idler gear	35. Countershaft 2nd gear
11. Input shaft 4th gear	24. Reverse shaft washer	36. Countershaft 3rd gear
12. Input shaft left bearing	25. Countershaft right bearing	37. 3rd & 4th gear spacer

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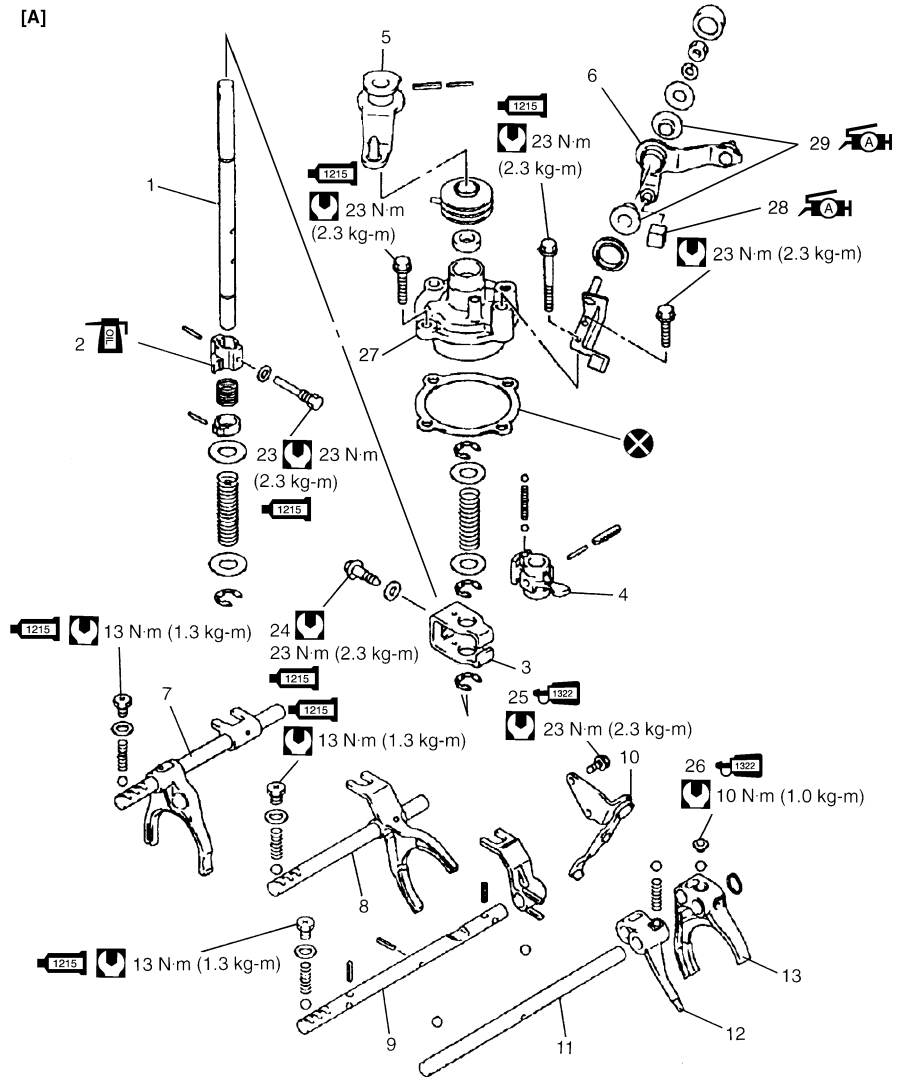
38. Countershaft 4th gear		42. Countershaft nut : After tightening nut to specified torque, caulk nut securely.	46. 2nd gear synchronizer inner ring
39. Countershaft left bearing	1322	43. Reverse shaft bolt : Apply thread lock cement 99000-32110 to thread part of bolt.	Tightening torque
40. Bearing set shim		44. Washer	Do not reuse.
41. Countershaft 5th gear		45. Center cone	Apply transmission oil.

GEAR SHIFTER & DIFFERENTIAL



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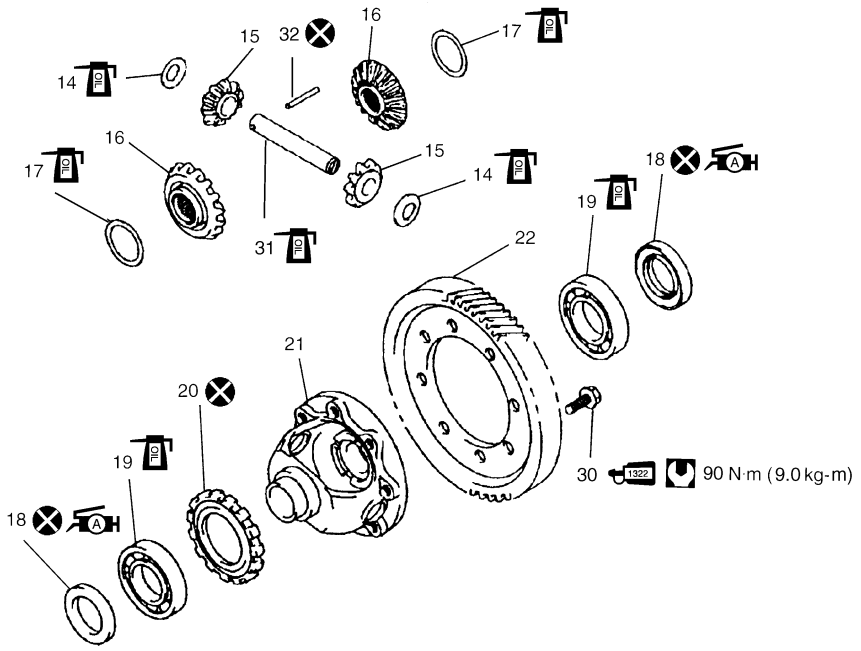
[B]



[A] : GEAR SHIFTER	12. Reverse gear shift arm	1322	25. Reverse gear shift lever bolt : Apply thread lock 99000-32110 to all around thread part of bolt.
[B] : DIFFERENTIAL	13. 5th gear shift fork	1322	26. 5th gear shift fork plug : Apply thread lock 99000-32110 to all around thread part of plug.
1. Gear shift & select shaft	14. Side gear washer		27. Guide case
2. 5th & reverse gear shift cam	15. Differential side pinion gear	A H	28. Select lever shaft bush : Apply grease 99000-25010 to whole area of bush.
3. Gear shift interlock plate	16. Differential side gear	A H	29. Select lever boss : Apply grease 99000-25010 to internal and external diameter
4. Gear shift & select lever	17. Side gear washer	1322	30. Final gear bolt : Apply thread lock 99000-32110 to all around thread part of bolt
5. Shift cable lever	A H 18. Differential side oil seal : Apply grease 99000- 25010 to oil seal lip.		31. Differential pinion shaft
6. Select cable lever	19. Differential side bearing		32. Differential pinion shaft pin
7. Low speed gear shift shaft	20. Speed sensor ring		Tightening torque
8. High speed gear shift shaft	21. Differential case		Do not reuse.
9. 5th & reverse gear shift shaft	22. Final gear	OIL	Apply transmission oil.
10. Reverse gear shift lever	1215 23. 5th to reverse interlock guide bolt : Apply sealant 99000-31110 to bolt thread.		
11. 5th & reverse gear shift guide shaft	1215 24. Gear shift interlock bolt : Apply sealant 99000-31110 to bolt thread.		

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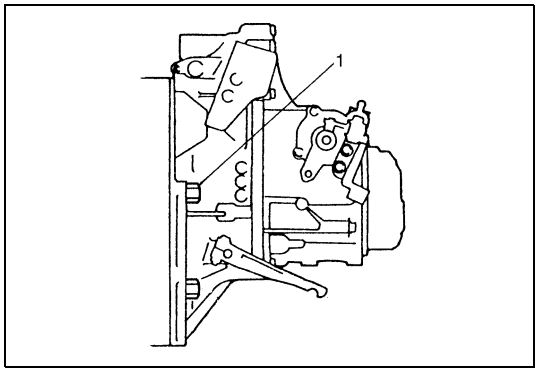
TRANSMISSION UNIT

DISMOUNTING

Under Hood

1) Disconnect negative cable at battery.
2) Undo wiring harness clamps, disconnect backup lamp switch coupler, VSS coupler and ground cable.
3) Disconnect clutch cable from clutch release lever and bracket.
4) Disconnect gear shift and select control cables.
5) Remove water pipe bracket bolts from transmission.

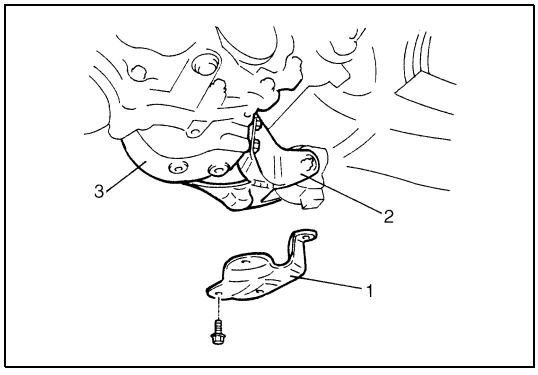


6) Remove transmission bolts (1).

7) Remove starting motor taking out its bolts.
8) Support engine by using lifting device.

On Lift

9) Drain transmission oil referring to “OIL CHANGE” in this section.
10) Remove left and right drive shaft referring to Section 4A.
11) Remove left side of engine under cover.



12) Remove engine rear mounting bracket stiffener (1).
13) Remove clutch housing lower plate.
14) Remove engine rear mounting No.1 bracket (2) with No.2 bracket (3).

15) Remove transfer referring to Section 7D (if equipped).
16) Remove transmission to engine bolt and nut.
17) Lower vehicle and support transmission with transmission jack.

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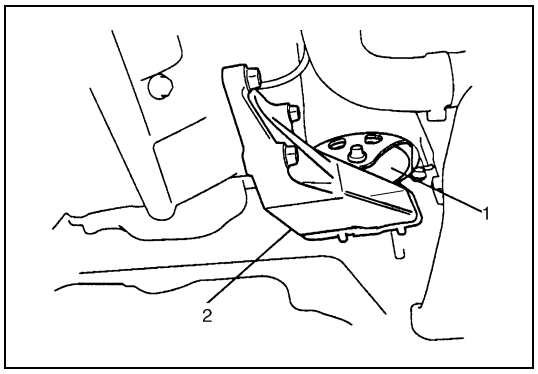

18) Remove engine left mounting (1) with bracket (2).

19) Remove other attached parts from transmission, if any.
20) Pull transmission out so as to disconnect input shaft from clutch disc and then lower it.

REMOUNTING

CAUTION:
Care should be taken not to scratch oil seal lip with drive shaft while raising transmission.
Do not hit drive shaft joint with hammer when installing it into differential gear.

Remount transmission in reverse order of dismounting procedure noting the following.

- Refer to Section 7D for installing transfer (if equipped).
- Refer to the first figure of “UNIT REPAIR OVERHAUL” for fastener specified torque.
- Push in drive shaft joints (right & left) fully so as to snap ring of shaft engages with differential gear.
- Set each clamp for wiring securely.
- After connecting clutch cable, be sure to adjust its play properly.
  Refer to Section 7C.
- Fill transmission with oil as specified.
- Connect battery and check function of engine, clutch and transmission.

UNIT DISASSEMBLY

FIFTH GEARS

1) Remove side cover bolts and take off transmission side cover.

CAUTION:
Care should be taken not to distort side cover when it is removed from left case.

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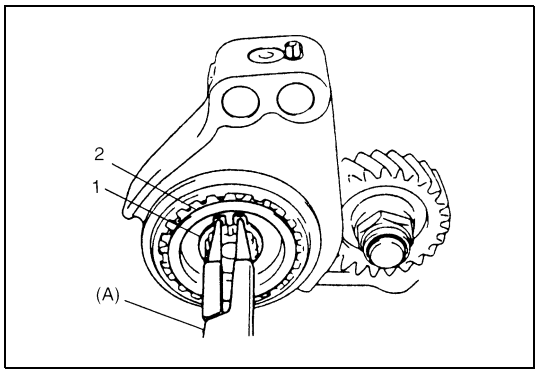
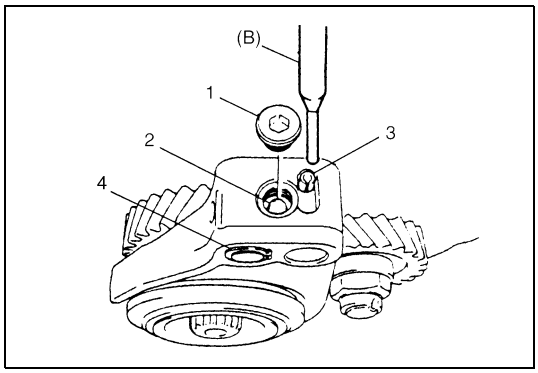


2) Using special tool, remove circlip (1) and then hub plate (2).

Special tool
(A) : 09900-06107



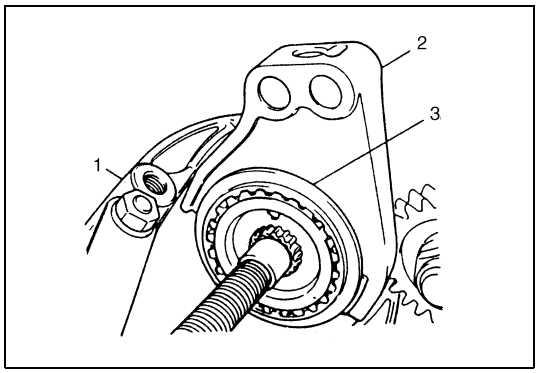
3) If equipped, remove shift fork plug (1) and guide ball (2).

NOTE:
Use of magnet would facilitate removal of guide ball.

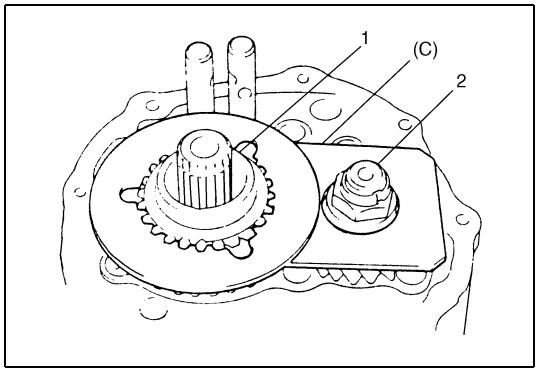
4) Drive out spring pin (3) by using special tool and hammer.

Special tool
(B) : 09922-85811

5) If equipped, remove circlip (4) by using circlip plier.

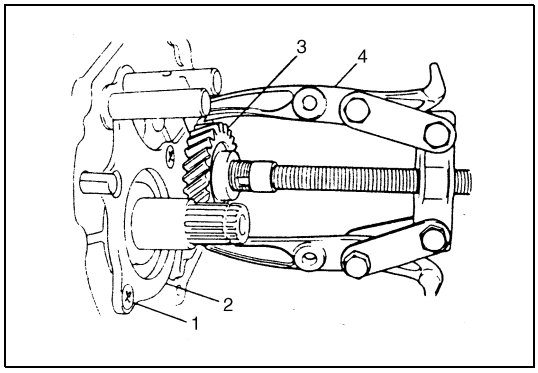


6) Remove gear shift fork (2), sleeve & hub assembly (3), synchronizer ring spring, synchronizer ring and 5th gear all together.Use gear puller (1) for removal if spline fitting of hub is tight.



7) Unfasten caulking of countershaft nut, install input shaft 5th gear (1) and special tool to stop rotation of shafts, and then remove countershaft nut (2).

Special tool
(C) : 09927-76010



8) Remove special tool, input shaft 5th gear, needle bearing of separated steel cage type and then counter shaft 5th gear. Gear puller (4) would be necessary if spline fitting of counter shaft 5th gear (3) is tight.
9) Remove plate screws (1) and take off left case plate (2), and then bearing set shim.

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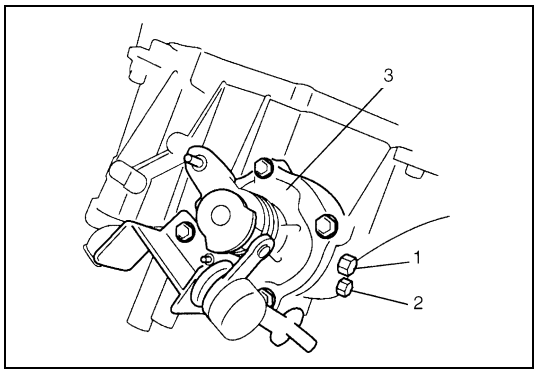
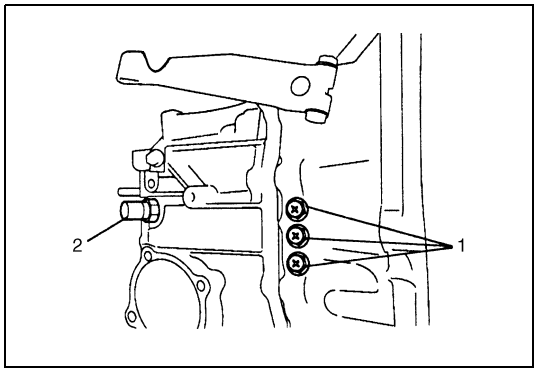
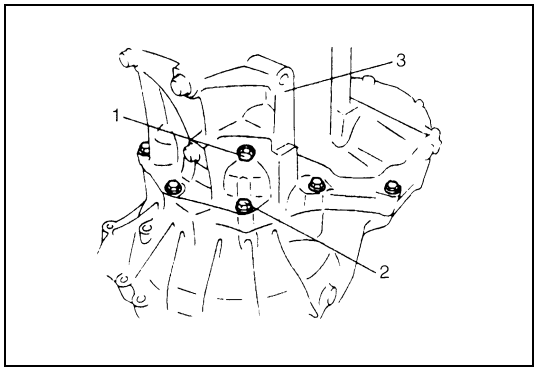
GEAR SHIFTER, INPUT SHAFT AND COUNTER SHAFT



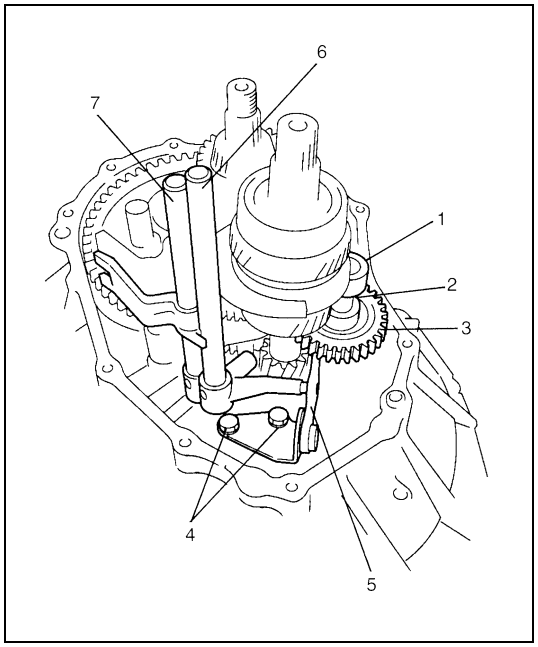
1) Remove gear shift interlock bolt (1) and 5th to reverse interlock guide bolt (2) from transmission case.
2) Remove gear shifter assembly (3).



3) Remove gear shift locating bolts (1) with washers, then take out locating springs and steel balls.
4) Remove back up light switch (2).



5) Remove reverse shaft bolt (1) with washer.
6) Remove case bolts (2) from outside and another bolts from clutch housing side.
7) Tapping left case (3) flanges with plastic hammer, remove left case.



8) Pull out reverse gear shaft (1) with washer (2), then take off reverse idler gear (3).
9) Remove reverse gear shift lever bolts (4), and reverse gear shift lever (5).
10) Pull out 5th & reverse gear shift guide shaft (6) together with 5th & reverse gear shift shaft (7).

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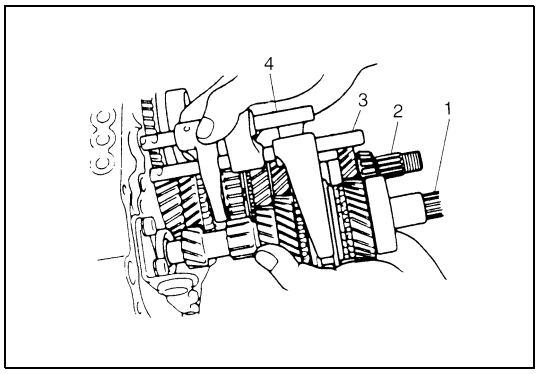
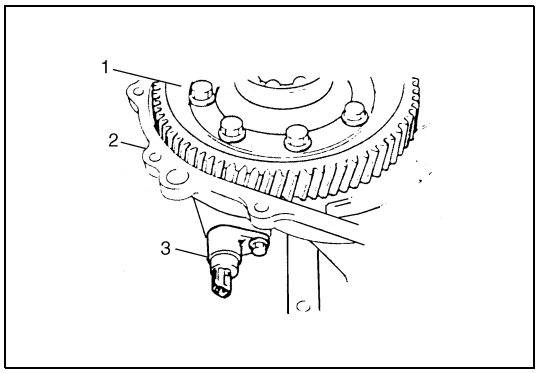


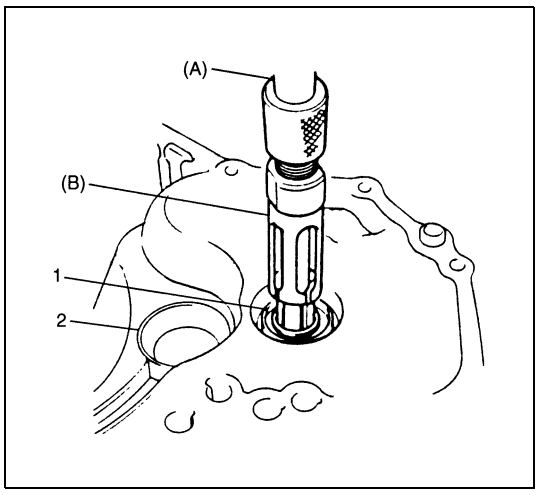
11) Tapping input shaft end with plastic hammer, push it out as assembly from case a little, then take out input shaft assembly (1), counter shaft assembly (2), high speed gear shift shaft (3) and low speed gear shift shaft (4) all at once.

12) Remove counter shaft left bearing cup from left case.
13) Remove differential side left oil seal also from left case.

RIGHT CASE



1) Remove differential gear assembly (1) from right case (2).
2) Remove bolt and then pull out VSS (3).



3) If input shaft right bearing has been left in right case, pull it out by using special tools.
   Remove input shaft oil seal (1) by using special tools.

   Special tool
   (A) : 09930-30104
   (B) : 09923-74510

4) Also pull out countershaft right bearing cup (2) by using special tools.

   Special tool
   09941-64511
   09923-30104

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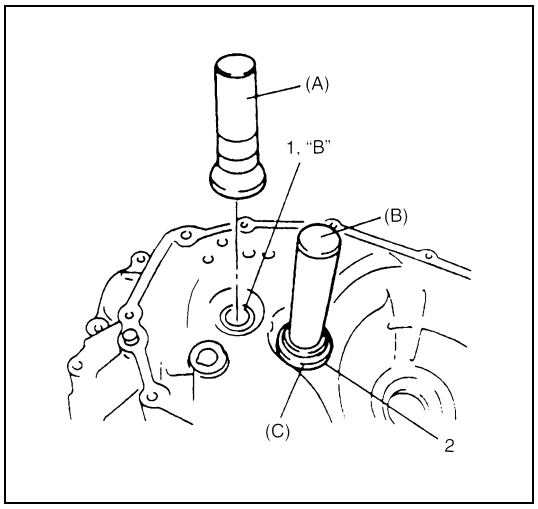
SUB ASSEMBLY SERVICE

NOTE:

Before installation, wash each part and apply specified gear oil to sliding faces of bearing and gear.

RIGHT CASE



1) Install input shaft oil seal (1) facing its spring side upward. Use special tool and hammer for installation and apply grease to oil seal lip.

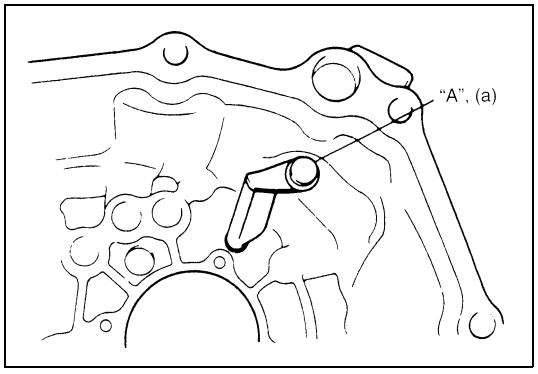
"B" : Grease 99000-25010

Special tool
(A) : 09951-76010

2) Install countershaft right bearing cup (2) by using special tools and hammer.

Special tool
(B) : 09924-74510
(C) : 09925-68210

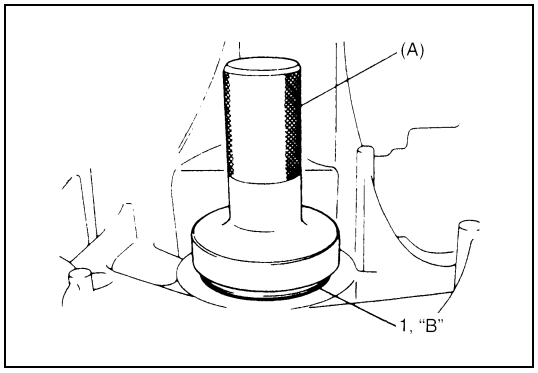
LEFT CASE



1) If input oil gutter has been removed, install it with bolt to which thread lock cement have been applied.

"A" : Thread lock cement 99000-32110

Tightening torque
Oil gutter bolt (a) : 10 N·m (1.0 kg-m, 7.5 lb-ft)



2) Install differential side left oil seal (1) facing its spring side inward until it becomes flush with case surface by using special tool with hammer, and then apply grease to its lip.

"B" : Grease 99000-25010

Special tool
(A) : 09913-75510

3) Install counter shaft left bearing cup into case bore by tapping it with plastic hammer lightly.

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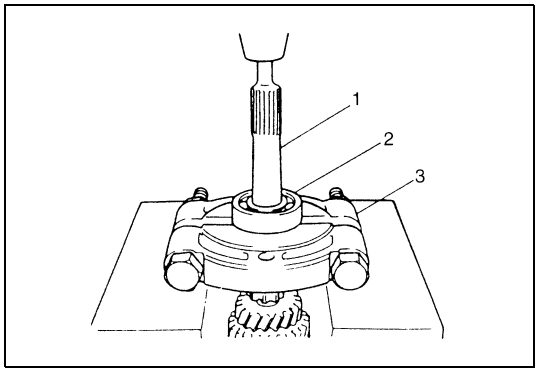
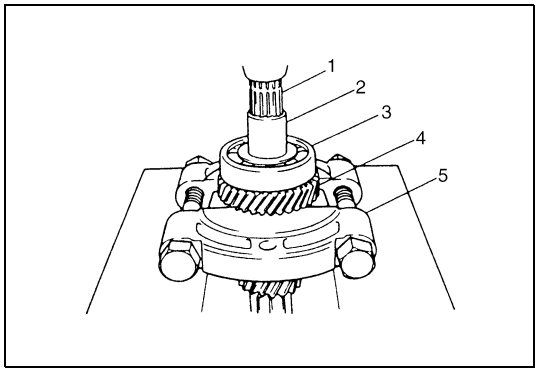
INPUT SHAFT ASSEMBLY

DISASSEMBLY



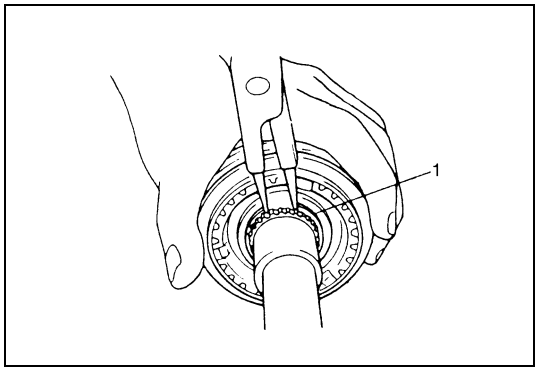
1) Remove input shaft right bearing (2) from input shaft (1) by using bearing puller (3) and press.



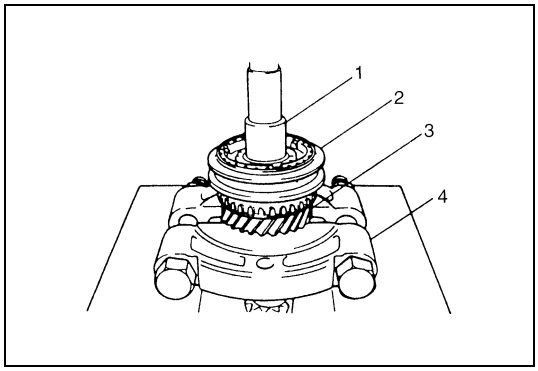
2) Drive out 5th gear spacer (2), left bearing (3) and 4th gear (4) all at once from input shaft (1) by using puller (5) and press.

CAUTION:
To avoid gear tooth from being damaged, support it at flat side of bearing puller.

3) Take out 4th gear needle bearing and high speed synchronizer ring.



4) Using circlip pliers, remove circlip (1).



5) Drive out high speed synchronizer sleeve & hub assembly (2) together with 3rd gear (3) from input shaft (1) by using puller (4) and press.

CAUTION:
Make sure to use flat side of puller to avoid causing damage to 3rd gear tooth.

6) Take out 3rd gear needle bearing from shaft.

7) Disassemble synchronizer sleeve & hub assembly.

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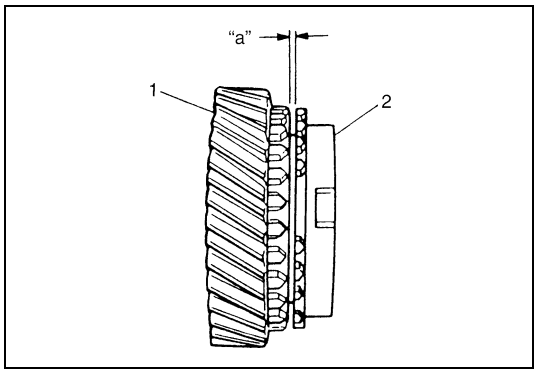
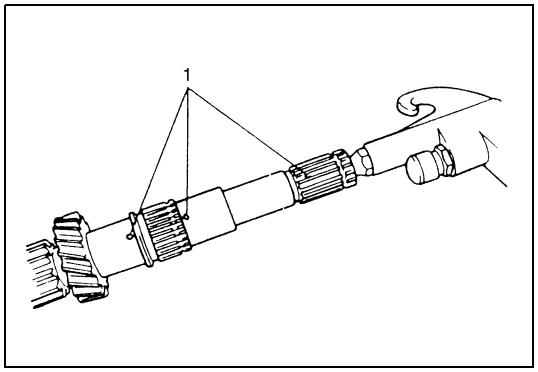
INSPECTION AND REASSEMBLY

1) Clean all components thoroughly, inspect them for any abnormality and replace with new ones as necessary.

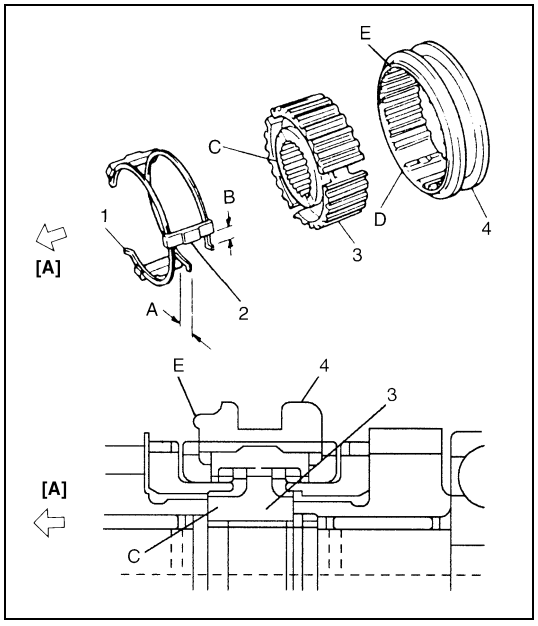


2) If synchronizer parts need to be repaired, check clearance "a" between ring (2) and gear (1), each chamfered tooth of gear, ring and sleeve, then determine parts replacement.

Clearance between synchronizer ring and gear
Standard "a" : 1.0 – 1.4 mm (0.039 – 0.055 in.)
Service limit "a" : 0.5 mm (0.019 in.)



3) To ensure lubrication, air blow oil holes (1) and make sure that they are free from any obstruction.



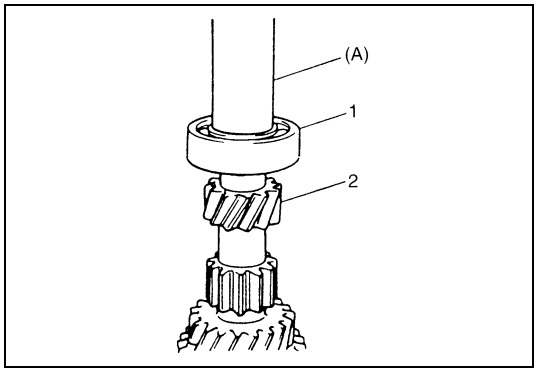
4) Fit high speed synchronizer sleeve (4) to hub (3), insert 3 keys (2) in it and then set springs (1) as shown in figure.

NOTE:

- **No specific direction is assigned to each key but it is assigned as sleeve & hub assembly.**
- **Size of high speed synchronizer sleeve, hub, keys and springs is between those of low speed and 5th speed ones.**

Synchronizer key installation position
: A = B

[A] :	3rd gear side
C :	Long flange
D :	Key way
E :	Projecting end



5) Drive in right bearing (1) to input shaft (2) by using special tool and hammer.

Special tool
(A) : 09913-80112

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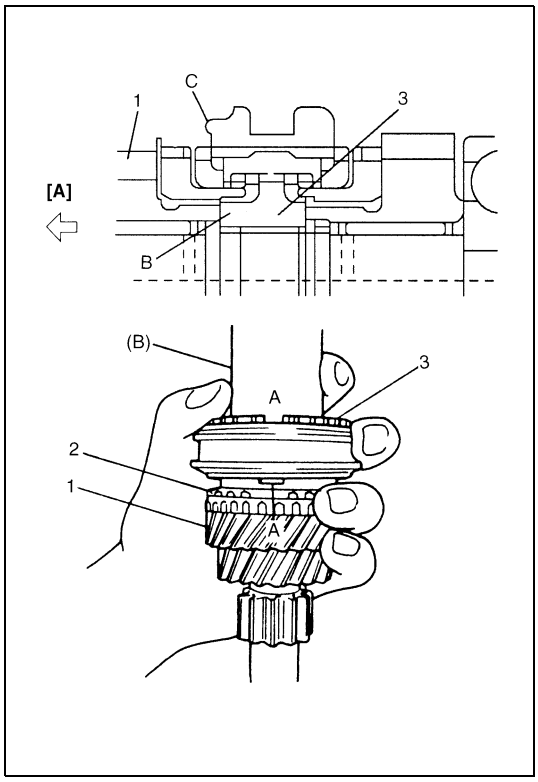


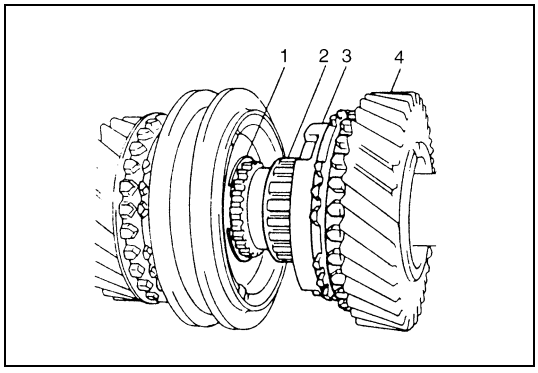
6) Install 3rd gear needle bearing of resin cage type, apply oil to it, then install 3rd gear (1) and synchronizer ring (2).
7) Drive in high speed sleeve & hub assembly (3) by using special tool and hammer, facing long flange side of hub to 3rd gear.

NOTE:

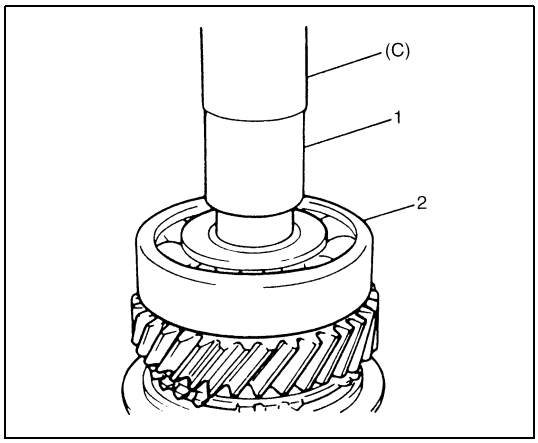
- **While press-fitting sleeve & hub, make sure that synchronizer ring key slots are aligned with keys in sleeve & hub assembly.**
- **Check free rotation of 3rd gear after press-fitting sleeve & hub assembly.**
- **Synchronizer rings for 3rd and 4th are identical.**

Special tool
(B) : 09913-84510

[A] :	3rd gear side
A :	Key way
B :	Long flange
C :	Projecting end



8) Install circlip (1) and confirm that circlip is installed in groove securely.
Install needle bearing (2) of steel cage type, apply oil to bearing and then install synchronizer ring (3) and 4th gear (4).



9) Press-fit left bearing (2) by using special tool and hammer.

Special tool
(C) : 09925-98221

10) Using the same special tool, drive in 5th gear spacer (1).

CAUTION:
To prevent 5th gear spacer from being distorted because of excessive compression, do not press-fit it with left bearing at once.

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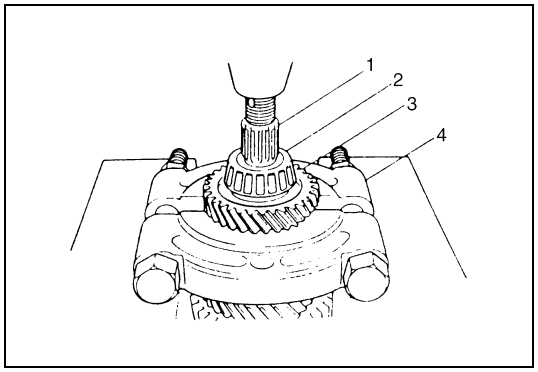
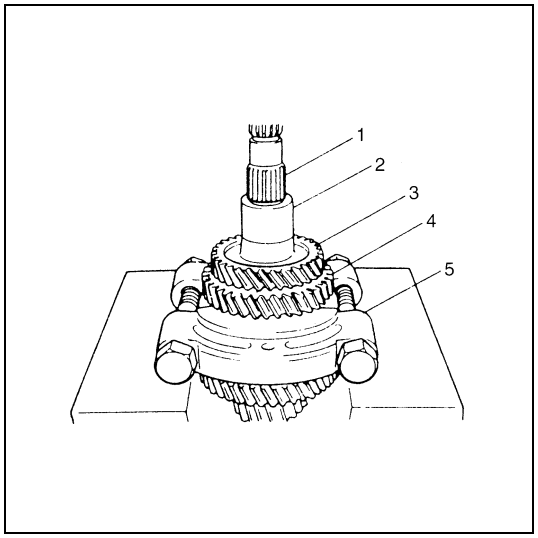
COUNTER SHAFT ASSEMBLY

DISASSEMBLY



1) Drive out left bearing cone (2) with 4th gear (3) from counter shaft (1) by using puller (4) and press.

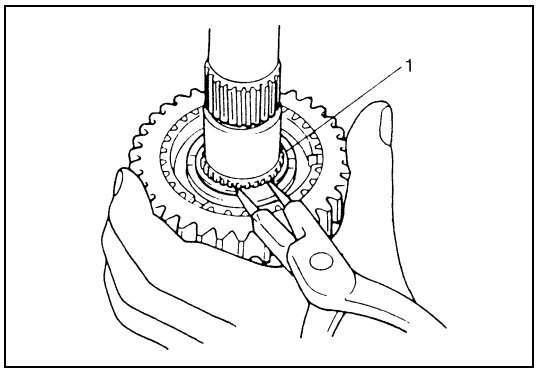
CAUTION:
- **Use puller and press that will bear at least 5 ton (11,000 lb) safely.**
- **To avoid tooth damage, support 4th gear at flat side of puller.**



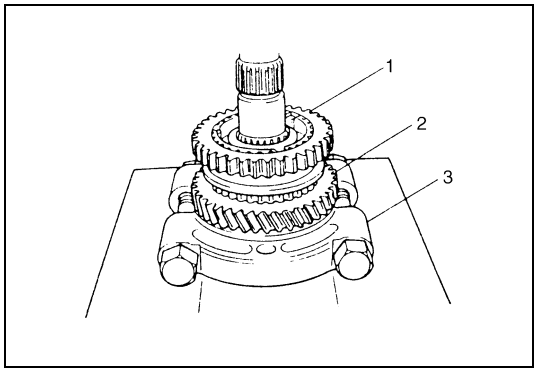
2) Apply puller (5) to 2nd gear (4) and drive out 3rd & 4th gear spacer (2) and 3rd gear (3) together with 2nd gear from counter shaft (1) by using press. Take out needle bearing of separated steel cage type from counter shaft.

CAUTION:
- **If compression exceeds 5 ton (11,000 lb), release compression once, reset puller support and then continue press work again.**
- **To avoid gear tooth from being damaged, support it at flat side of bearing puller.**

3) Take out 2nd synchronizer outer ring, center cone and inner ring.



4) Using circlip pliers, remove circlip (1).



5) Apply puller (3) to 1st gear (2) and drive out low speed synchronizer sleeve & hub assembly (1) with gear by using press.

CAUTION:
To avoid gear tooth from being damaged, support it at flat side of bearing puller.

6) Disassemble synchronizer sleeve & hub assembly.

7) Take out needle bearing from shaft.

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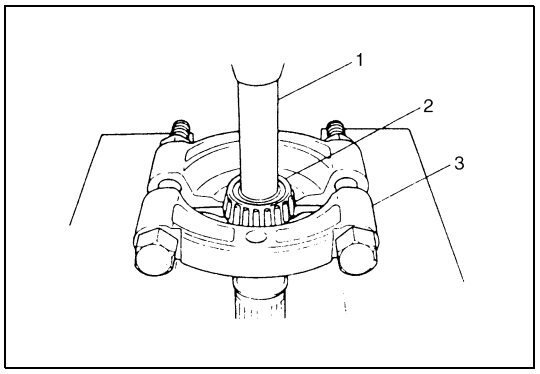
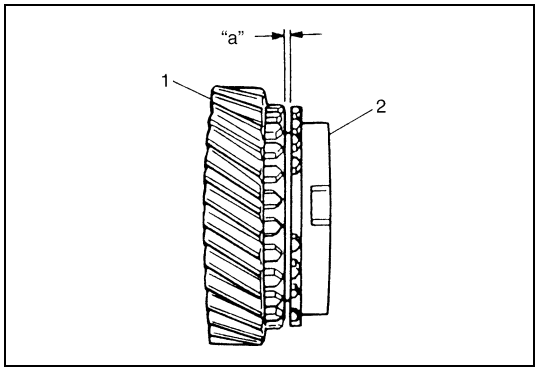


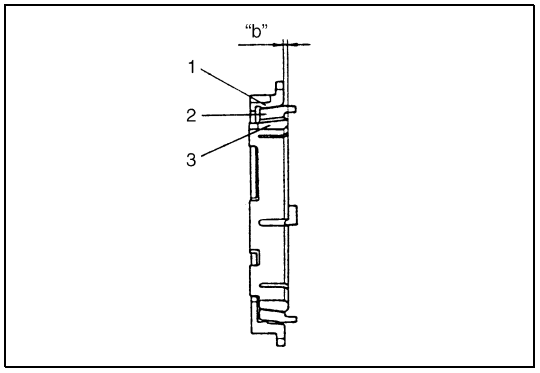
8) Remove right bearing cone (2) by using puller (3), metal stick (1) and press.

INSPECTION AND REASSEMBLY



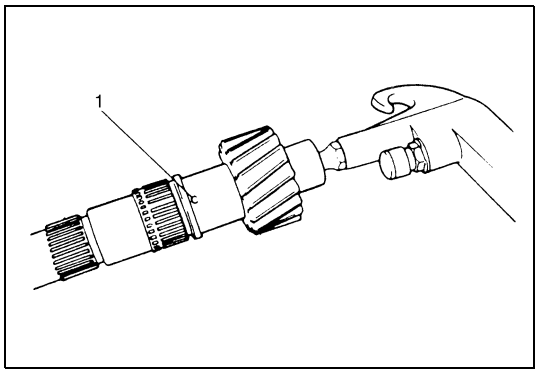
1) Clean all components thoroughly, inspect them for any abnormality and replace with new ones as necessary.
2) If synchronizer parts need to be repaired, check clearance "a" between ring (2) and gear (1), each chamfered tooth of gear, ring and sleeve, then determine parts replacement.

Clearance between synchronizer ring and gear
Standard "a" : 1.0 – 1.4 mm (0.039 – 0.055 in.)
Service limit "a" : 0.5 mm (0.019 in.)



3) Put the synchronizer outer ring (1), inner ring (3) and the cone (2) together and then measure the step difference between the outer ring and the inner ring. And also check each chamfered tooth of gear and synchronizer ring and replace with new one, if necessary. Also, check gear tooth.

Difference between synchronizer outer ring and inner ring
Standard "b" : 1.0 – 1.4 mm (0.039 – 0.055 in.)
Service limit "b" : 0.5 mm (0.019 in.)



4) To ensure lubrication, air blow oil holes (1) and make sure that they are free from any obstruction.

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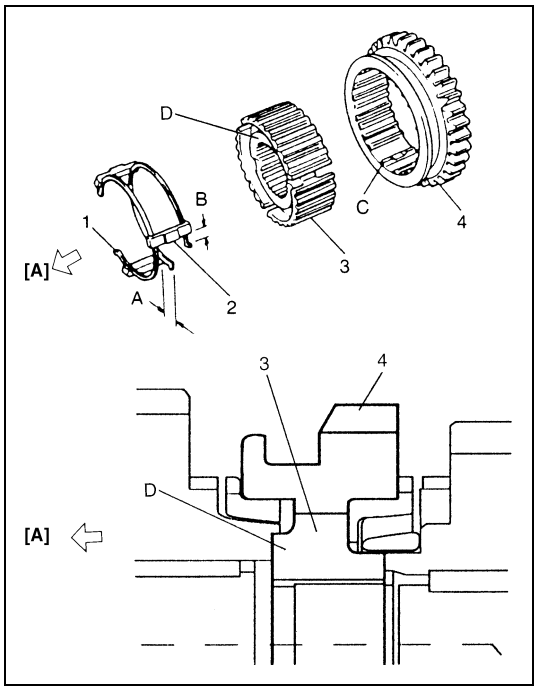


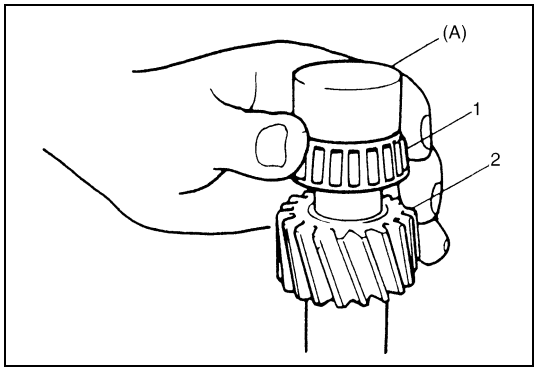
5) Fit low speed synchronizer sleeve (4) to hub (3), insert 3 keys (2) in it and then set springs (1) as shown in figure.

NOTE:

- **No specific direction is assigned to each key but it is assigned as sleeve & hub assembly.**
- **Size of low speed synchronizer keys and springs are the largest compared with those of high speed and 5th speed ones.**

Synchronizer key installation position
: A = B

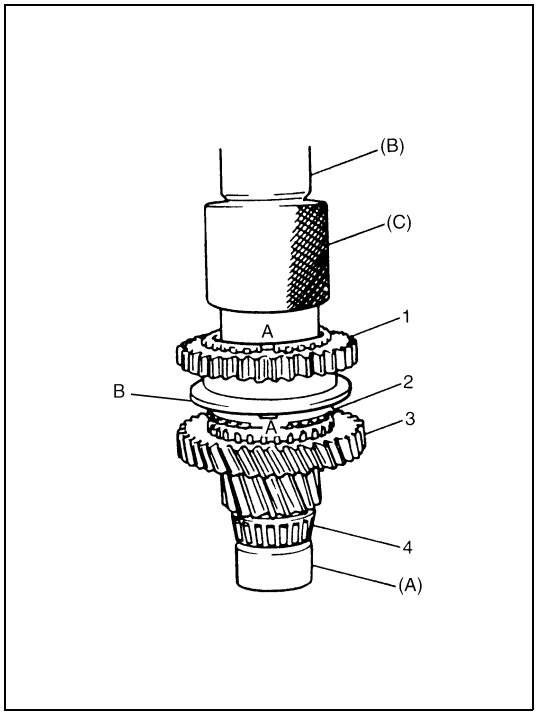
[A] :	1st gear side
C :	Key way
D :	Short flange



6) Install right bearing cone (1) to counter shaft (2) by using special tool and hammer.

Special tool
(A) : 09923-78210

7) Install needle bearing of resin cage type, apply oil to it, then install 1st gear and 1st gear synchronizer ring.



8) Drive in low speed sleeve & hub assembly (1) by using special tools and hammer, facing “B” side of sleeve to 1st gear.

NOTE:

- **Support shaft with special tool as shown in figure so that retainer of bearing cone (4) will be free from compression.**
- **Make sure that synchronizer ring (2) key slots are aligned with keys while press-fitting sleeve & hub assembly.**
- **Check free rotation of 1st gear (3) after press-fitting sleeve & hub assembly.**

Special tool
(A) : 09923-78210
(B) : 09925-18011
(C) : 09940-53111

A :	Align key slots with keys

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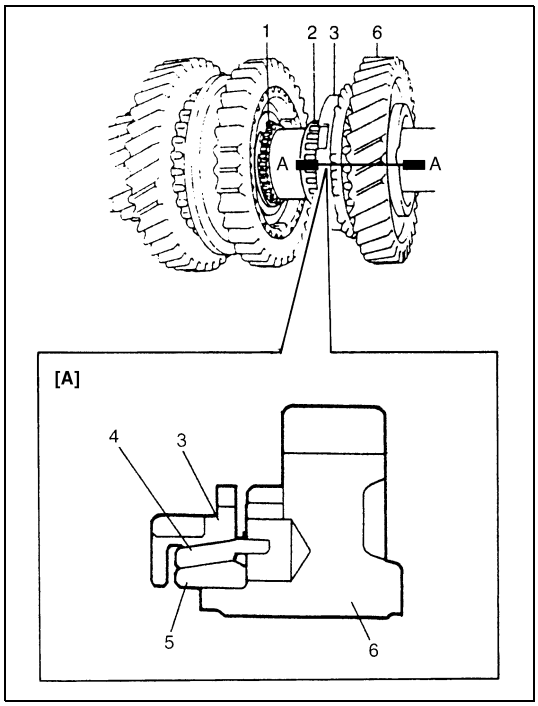
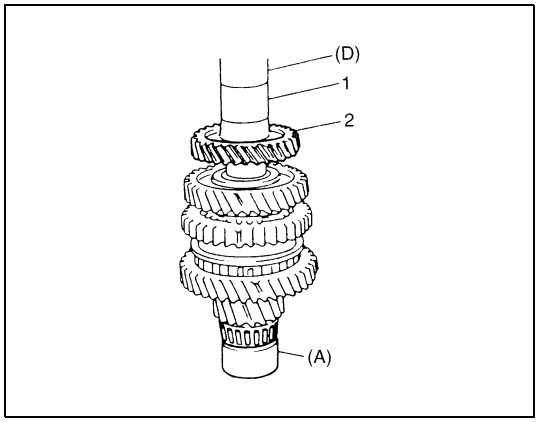


9) Install circlip (1) and confirm that circlip is installed in groove securely.
Install needle bearing (2) of separated steel cage type, apply oil to bearing.
With synchronizer outer ring (3), center cone (4) & inner ring (5) put together and installed to 2nd gear (6) as shown in figure.

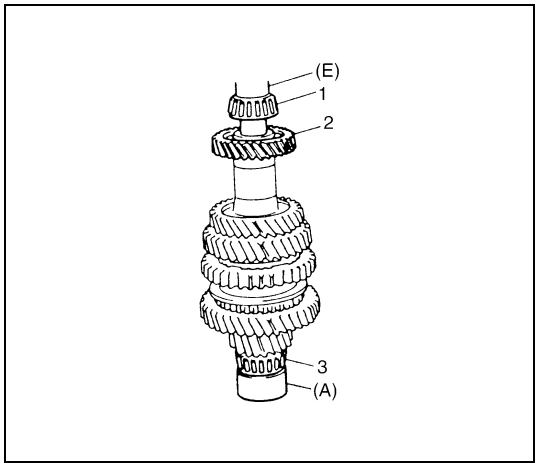
[A] : SECTION A - A



10) Press-fit 3rd gear (2) and spacer (1) by using special tools and press.

CAUTION:
Press-fit 3rd gear and spacer first, and then 4th gear later separately so that counter shaft will not be compressed excessively.

Special tool
(A) : 09923-78210
(D) : 09913-80112



11) Press-fit 4th gear (2) by using the same procedure as the above.
12) Install left bearing cone (1) by using special tools and hammer.

NOTE:
For protection of right bearing cone (3), always support shaft with special tool as illustrated.

Special tool
(A) : 09923-78210
(E) : 09925-98221

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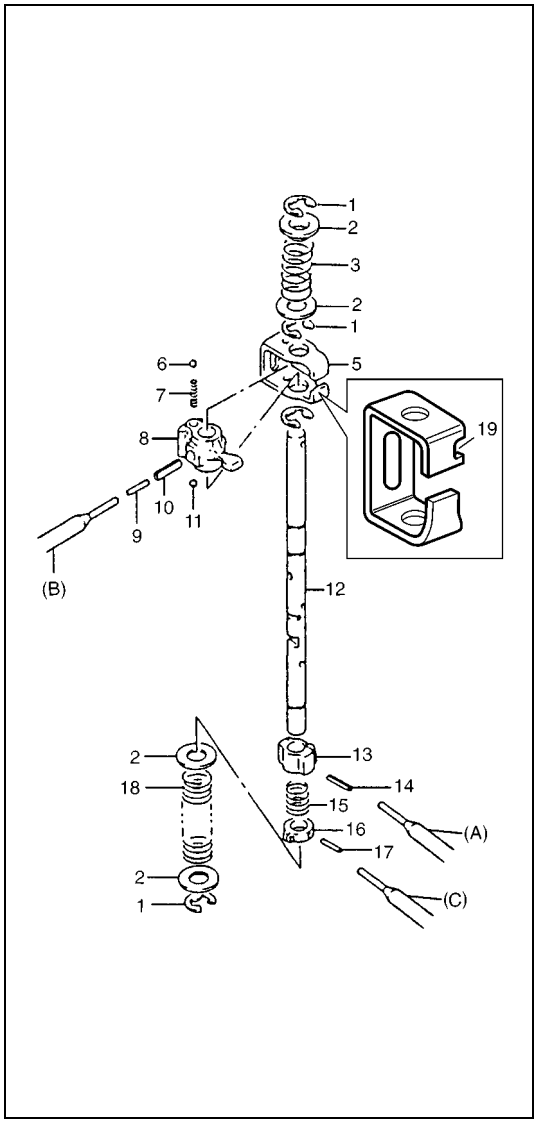
GEAR SHIFTER

Gear Shift and Select Shaft Assembly



1) Push spring pins out using specified spring pin removers as shown bellow.

Special tool
(A) : 09922-85811 (4.5 mm)
(B) : 09925-78210 (6.0 mm)
(C) : 2.8 – 3.0 mm (0.11 – 0.12 in.) Commercially available spring pin remover

2) Inspect component parts for wear, distortion or damage. If any detect is found, replace detective part with new one.

NOTE:

- **When driving in spring pins, prevent shaft from being bent by supporting it with wood block.**
- **Assemble 5th & reverse gear shift cam with its pit and spring pin aligned.**
- **Make sure to select an appropriate spring by identifying the painted colors to keep gear shifting performance as designed.**
  - **– Low speed select spring - No paint**
  - **– Reverse select spring - Pink**
- **Gear shift interlock plate has a specific installation direction. Install it by locating notch (19) at the side of shift cable lever.**

1. E-ring	10. Spring pin
2. Washer	11. Ball
3. Reverse select spring	12. Gear shift & select shaft
4. Blank	13. 5th & reverse gear shift cam
5. Gear shift interlock plate	14. Spring pin
6. Ball	15. Cam guide return spring
7. Gear shift interlock spring	16. 5th & reverse gear shift cam guide
8. Gear shift & select lever	17. Spring pin
9. Spring pin	18. Low speed select spring

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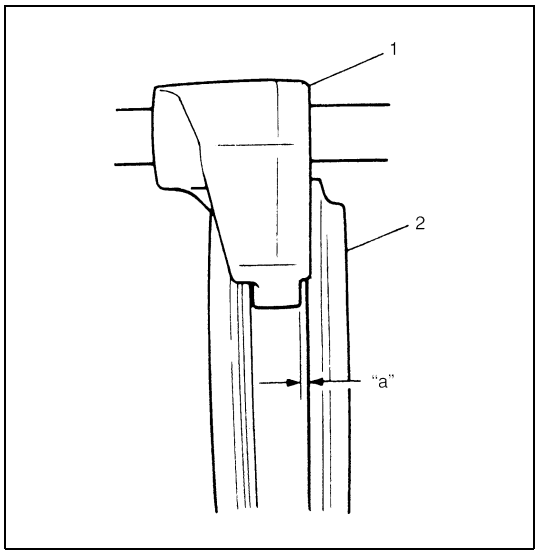
High Speed and Low Speed Gear Shift Shafts Inspection



1) Using feeler gauge, check clearance between fork (1) and sleeve (2) and replace those parts if it exceeds limit below.

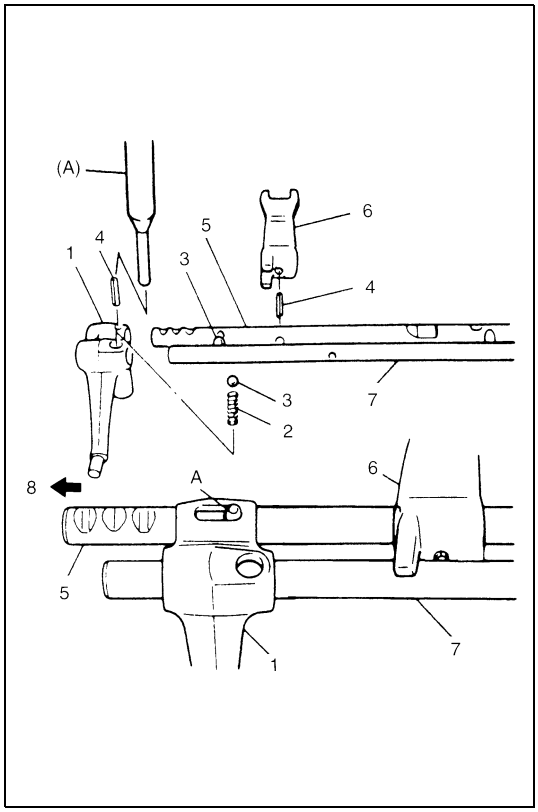
NOTE:

For correct judgement of parts replacement, carefully inspect contact portion of fork and sleeve.

Clearance between fork and sleeve
Service limit "a" : 1.0 mm (0.039 in.)

2) Insert each gear shift shaft into case and check that it moves smoothly. If it doesn't, correct by using oilstone, reamer or the like.

5th & Reverse Gear Shifter



1) Disassemble component parts by using special tool and hammer.

Special tool
(A) : 09922-85811

2) Replace or correct parts as required and assemble shafts making sure that component parts are in proper order as shown in figure.

NOTE:

- **Distinguish reverse gear shift arm spring (Blue) (2) from low speed locating spring (Yellow).**
- **Install 2 steel balls (3) in reverse gear shift arm (1) without fail.**
- **Drive in spring pin for reverse shift arm facing slit A toward front.**

1. Reverse gear shift arm	6. 5th & reverse gear shift yoke
2. Reverse gear shift arm spring (Blue)	7. 5th & reverse gear shift guide shaft
3. Steel ball	8. 5th gear side
4. Spring pin	A: Face pin slit toward 5thn gear side
5. 5th & reverse gear shift shaft	

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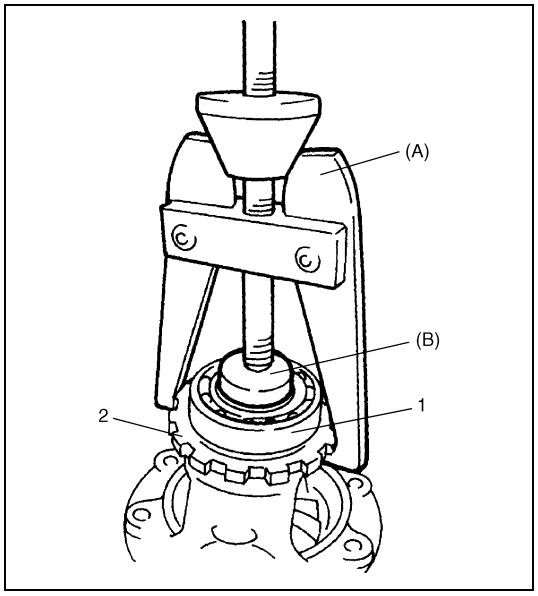
DIFFERENTIAL ASSEMBLY

DISASSEMBLY

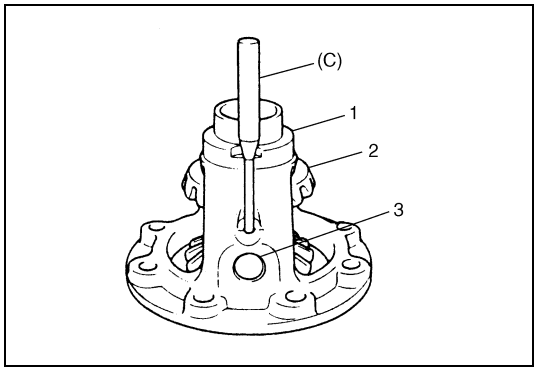


1) Using special tools, remove right bearing (1) and sensor rotor (2).

Special tool
(A) : 09913-60910
(B) : 09925-88210

2) Remove left bearing in the same manner.

3) Support differential case with soft jawed vise and remove final gear bolts then take out final gear.



4) Using special tool and hammer, drive out differential pinion shaft pin and then disassemble component parts.

Special tool
(C) : 09922-85811

1.	Differential case
2.	Differential gear
3.	Differential pinion shaft

ADJUSTMENT AND REASSEMBLY

Judging from abnormality noted before disassembly and what is found through visual check of component parts after disassembly, prepare replacing parts and proceed to reassembly. Make sure that all parts are clean.

1) Assemble differential gear and measure thrust play of differential gear as follows.

Differential gear thrust play
: 0.03 – 0.31 mm (0.001 – 0.012 in.)

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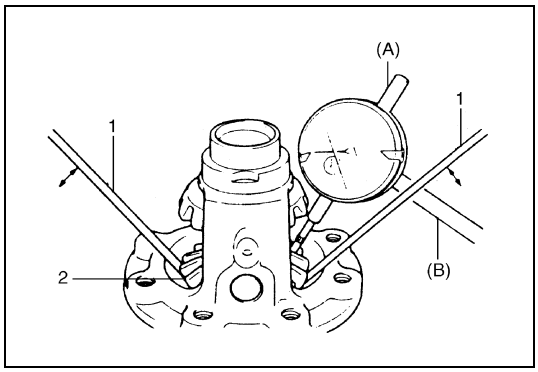
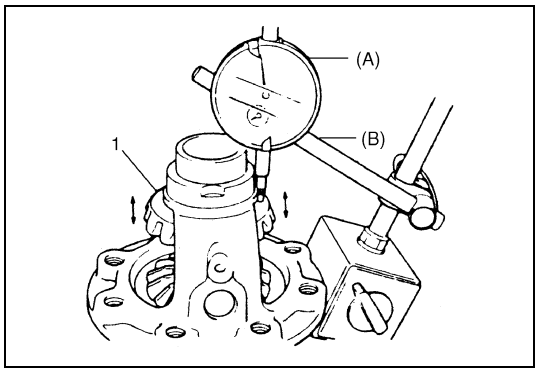
Left side



- Hold differential assembly with soft jawed vise and apply measuring tip of dial gauge to top surface of gear.
- Using 2 screwdrivers (1), move gear (2) up and down and read movement of dial gauge pointer.

Special tool
(A) : 09900-20606
(B) : 09900-20701

Right side

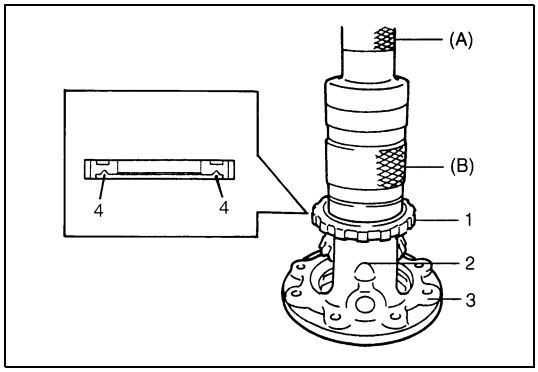


- Using similar procedure to the above, set dial gauge tip to gear (1) shoulder.
- Move gear up and down by hand and read dial gauge.

Special tool
(A) : 09900-20606
(B) : 09900-20701

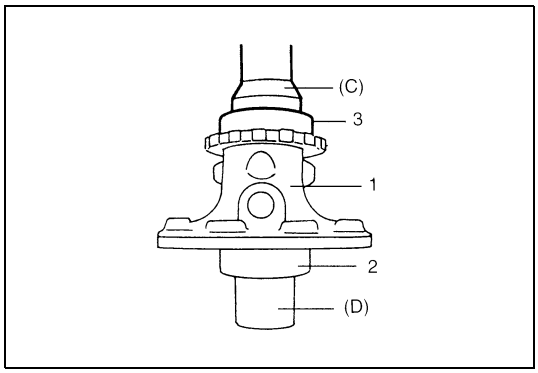
2) If thrust play is out of specification, select suitable thrust washer from among the following available size, install it and check again that specified gear play is obtained.

Available thrust washer thickness
0.9, 0.95, 1.0, 1.05, 1.1, 1.15 and 1.2 mm
(0.035, 0.037, 0.039, 0.041, 0.043, 0.045, and 0.047 in.)



3) Drive in new differential pinion shaft pin (2) till the depth from differential case (3) surface is about 1 mm (0.04 in.).
4) Press-fit new sensor rotor (1) with groove (4) side downward as shown by using special tools and copper hammer.

Special tool
(A) : 09913-75510
(B) : 09940-54910



5) Press-fit left bearing by using special tools and copper hammer.
6) Support differential assembly (1) as illustrated so as to left bearing (2) is floating, and then press-fit right bearing (3) like left bearing in Step 5).

Special tool
(C) : 09951-76010
(D) : 09951-16060

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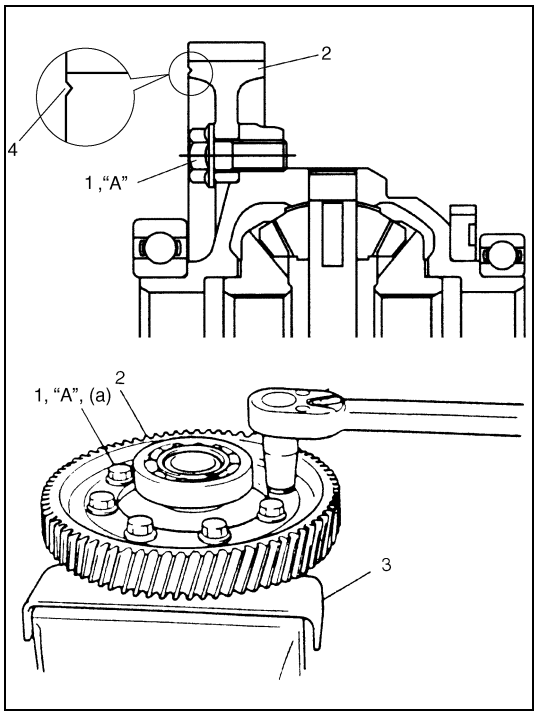

7) Hold differential assembly with soft jawed vise (3), install final gear (2) as shown in figure and then tighten bolts (1) with thread lock cement applied to specified torque.

NOTE:

Make sure to install final gear in correct installing direction.

CAUTION:

Use of any other bolts than specified ones is prohibited.

"A" : Thread lock cement 99000-32110

Tightening torque

Final gear bolts (a) : 90 N·m (9.0 kg-m, 65.0 lb-ft)

4. Groove

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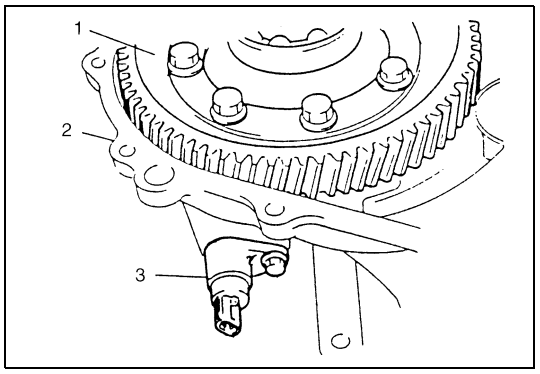
UNIT ASSEMBLY

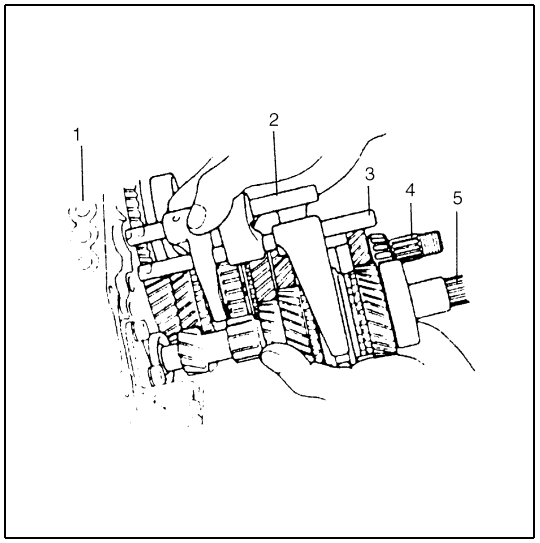
DIFFERENTIAL TO LEFT CASE

ASSEMBLY



1) Install differential assembly (1) into right case (2).
2) Insert VSS (3) with grease applied to its O-ring, then tighten it with bolt.

Grease 99000-25010

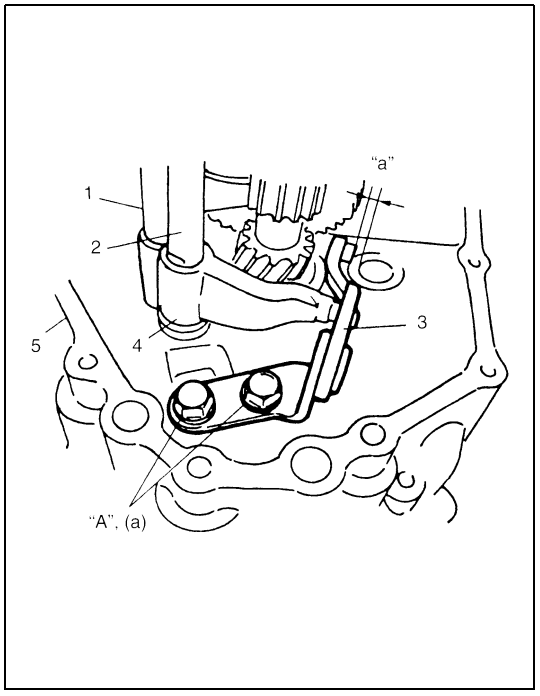


3) Join input shaft (5), countershaft (4), low speed gear shift shaft (2) and high speed gear shift shaft (3) assemblies all together, then install them into right case (1).

CAUTION:
Take care not to damage oil seal lip by input shaft, or oil leakage may take place.

NOTE:

- **Input shaft right bearing on shaft can be installed into right case by tapping shaft with plastic hammer.**
- **Check to make sure that counter shaft is engaged with final gear while installing.**



4) Install 5th & reverse gear shift shaft (1) with 5th & reverse gear shift guide shaft (2) into right case (5). Reverse gear shift arm (4) has to be joined with reverse gear shift lever (3) at the same time.
5) Place reverse gear shift lever, fasten it with bolts after applying thread lock cement.

"A" : Thread lock cement 99000-32110

Tightening torque
Revers gear shift lever bolts
(a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

NOTE:

- **When installing reverse gear shift lever, set it as the following specification.**

Distance between lever end and shaft bore
"a" : 5 mm (0.2 in.)

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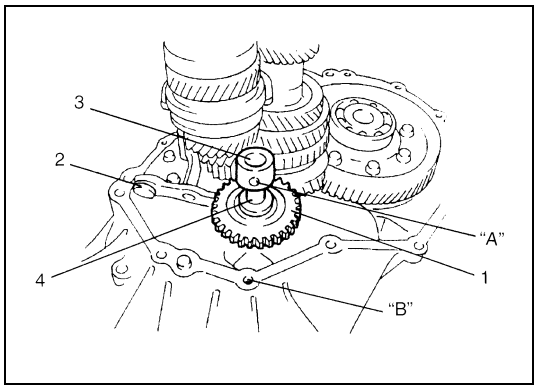
NOTE:

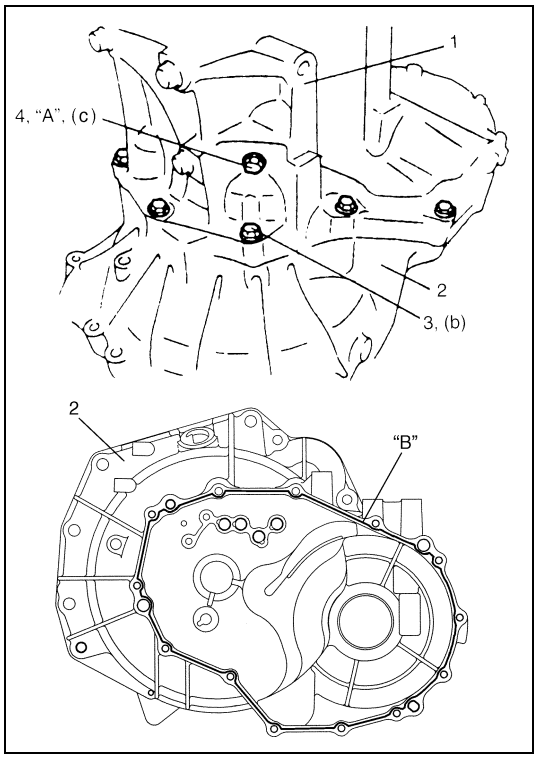
- **Distance "a" can be measured by installing reverse gear shaft provisionally.**
- **When "a" is 5 mm (0.2 in.), clearance between reverse idler gear groove and shift lever end will be 1 mm (0.04 in.).**



6) Make reverse idler gear (1) with reverse gear shift lever (2), insert reverse gear shaft (3) into case through idler gear and then align "A" in shaft with "B" in case.

NOTE:

- **Make sure that washer (4) has been installed in shaft at above the gear.**
- **Check to confirm that reverse gear shift lever end has clearance 1 mm (0.04 in.) to idler gear groove.**



7) Clean mating surfaces of both right and left cases, apply sealant to right case (2) by using a nozzle as shown in figure by such amount that its section is 1.5mm (0.059 in.) in diameter then mate it with left case (1).

"B" : Sealant 99000-31110

8) Tighten case bolts (3) from left case side to specified torque.

Tightening torque
Transmission case bolts (b) : 19 N·m (1.9 kg-m, 14.0 lb-ft)

9) Install reverse shaft bolt (4) to which thread lock cement have been applied with aluminum washer and tighten it.

"A" : Thread lock cement 99000-32110

Tightening torque
Reverse shaft bolt (c) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

10) Install another case bolts from clutch housing side and tighten them to specification.

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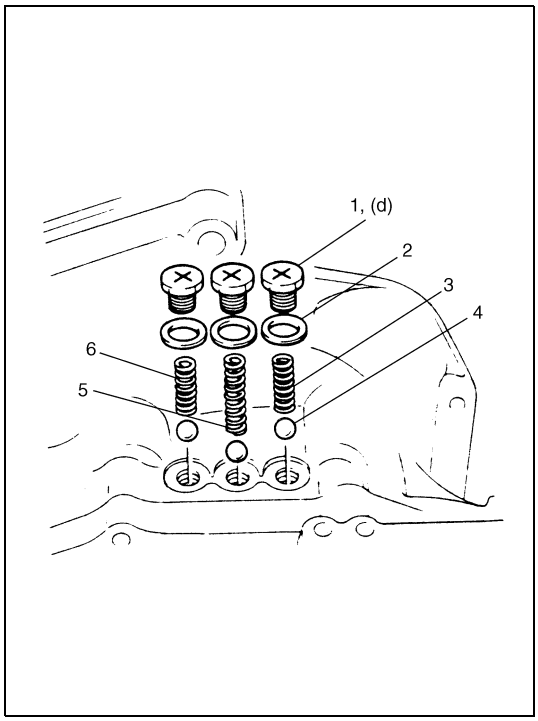


11) Check locating spring for deterioration and replace with new one as necessary.

Locating spring free length
For Low speed (3) and 5th & reverse (6)
Standard : 26.1 mm (1.028 in.)
Service Limit : 25.0 mm (0.984 in.)
For High speed (5)
Standard : 40.1 mm (1.579 in.)
Service Limit : 39.0 mm (1.535 in.)

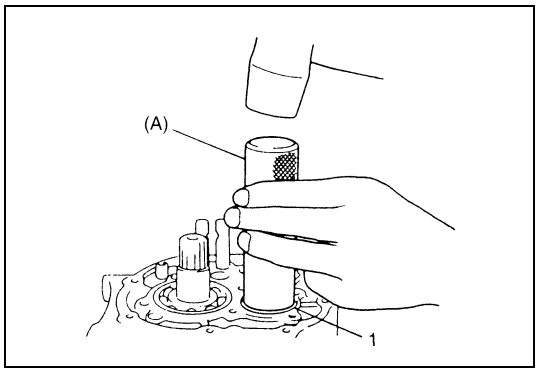
12) Install steel ball (4) and locating spring for respective gear shift shaft and tighten bolt (1) to which sealant have been applied to its thread part.

Sealant 99000-31110

Tightening torque
Locating spring bolts (d) : 13 N·m (1.3 kg-m, 9.5 lb-ft)

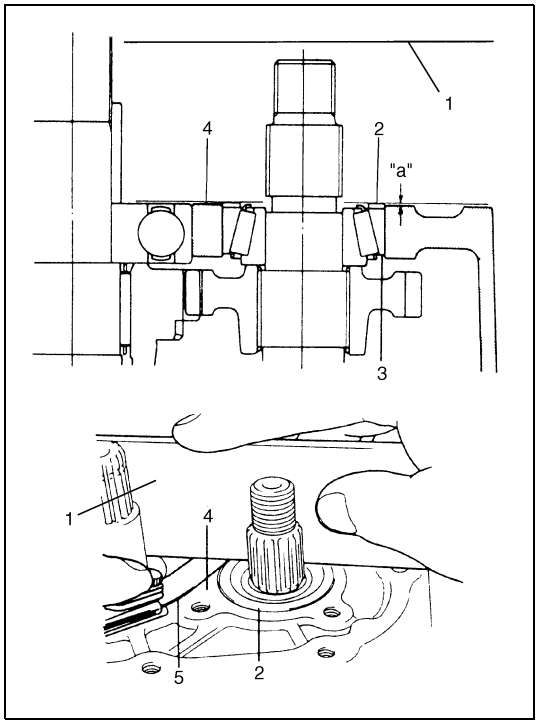
2. Washer

FIFTH GEARS



1) To seat countershaft left bearing cup (1) to bearing cone, tap cup by using special tool and plastic hammer.

Special tool
(A) : 09913-84510



2) Put a shim (2) on bearing cup (3) provisionally, place straight edge (1) over it and compress it by hand through straight edge, and then measure “a” (Clearance between case surface (4) and straight edge) by using feeler gauge (5).

Clearance between case surface and straight edge
“a” : 0.13 – 0.17 mm (0.0051 – 0.0067 in.)
(Shim protrusion)

3) By repeating above step, select a suitable shim which adjusts clearance “a” to specification and put it on bearing cup.

NOTE:

Insert 0.15 mm (0.0059 in.) feeler to know whether or not a shim fulfills specification quickly.

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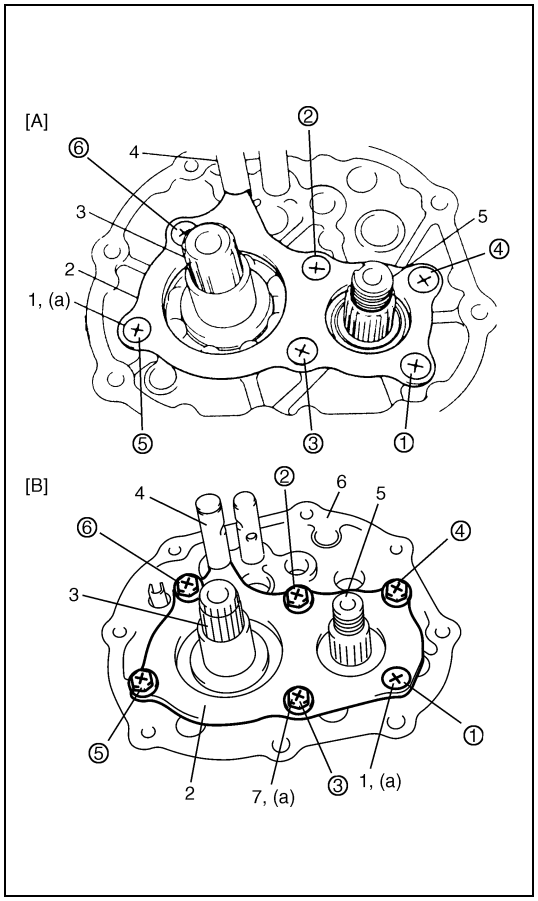
Available shim thickness
0.40, 0.45, 0.50, 0.55, 0.6, 0.65,0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1.0,1.05, 1.1 and 1.15 mm (0.015, 0.017, 0.019, 0.021, 0.023,0.025, 0.027, 0.029, 0.031, 0.033,0.035, 0.037, 0.039, 0.041, 0.043 and 0.045 in.)



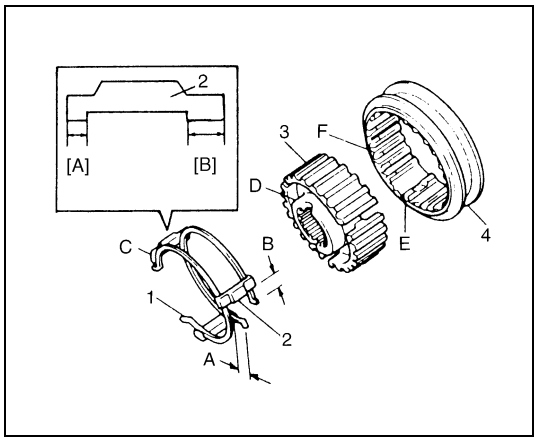
CAUTION:
Do not reuse left case plate screw(s) (1) (and bolts (7)). Be sure to use new adhesive pre-coated screw(s) (and new adhesive pre-coated bolts). Otherwise, screw(s) (and/or bolts) may loosen.

4) Place left case plate (2) inserting its end in groove of shift guide shaft (4) and tighten new adhesive pre-coated screw(s) (1) (and new adhesive per-coated bolts (7) temporarily with less than specified toque.
5) Tighten new screw(s) (and new bolts) to specified torque finally in the order of circled numbers (①→②→③→④→⑤→⑥) shown in figure.

NOTE:
After tightening screw(s) (and bolts), make sure that countershaft (5) can be rotated by hand feeling certain load.

Tightening torque
Left case plate screw(s) (and bolts)
(a) : 11 N·m (1.1 kg-m, 8.0 lb-ft)

[A]: In case 6 screws are used	3. Input shaft
[B]: In case 1 screw and 5 bolts are used	6. Transaxle left case

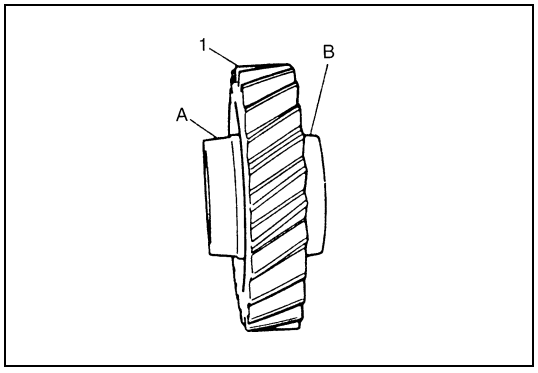


6) Assemble 5th speed synchronizer sleeve (4) and hub (3) with keys (2) and springs (1).

NOTE:
Short side C in keys, long flange D in hub and chamfered spline F in sleeve should face inward (5th gear side).

Synchronizer key installation position
: A = B

[A] : Short side C	D : Long flange (Inward)
[B] : Long side	E : Key way
C : Short side (Inward)	F : Chamfered spline (Inward)



7) Install 5th gear (1) to counter shaft facing machined boss A inward.

A : Machined boss (Inside)
B : No machining (Outside)

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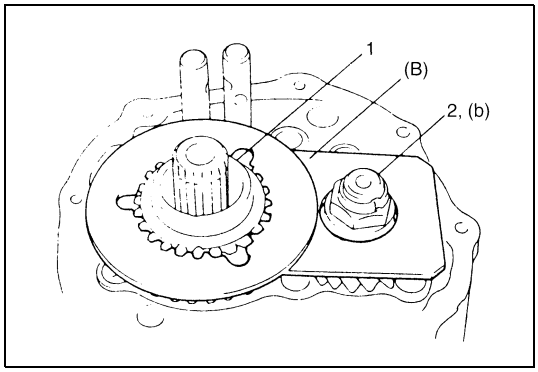
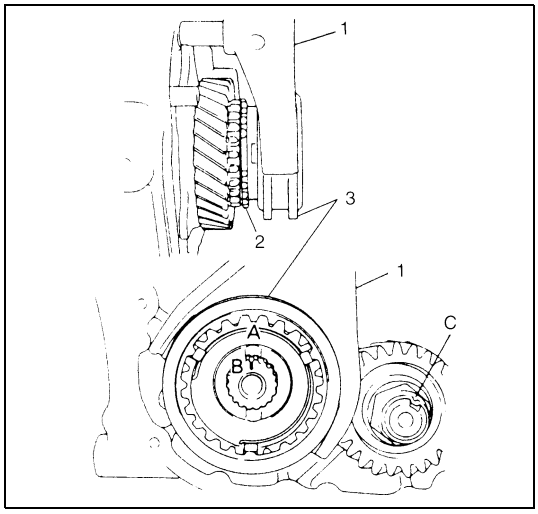


8) Install needle bearing of separated steel cage type to input shaft, apply oil then install 5th gear (1) and special tool to stop shaft rotation.

Special tool
(B) : 09927-76010

9) Install new countershaft nut (2) and tighten it to specification.

Tightening torque
Countershaft nut (b) : 60 N·m (6.0 kg-m, 43.5 lb-ft)

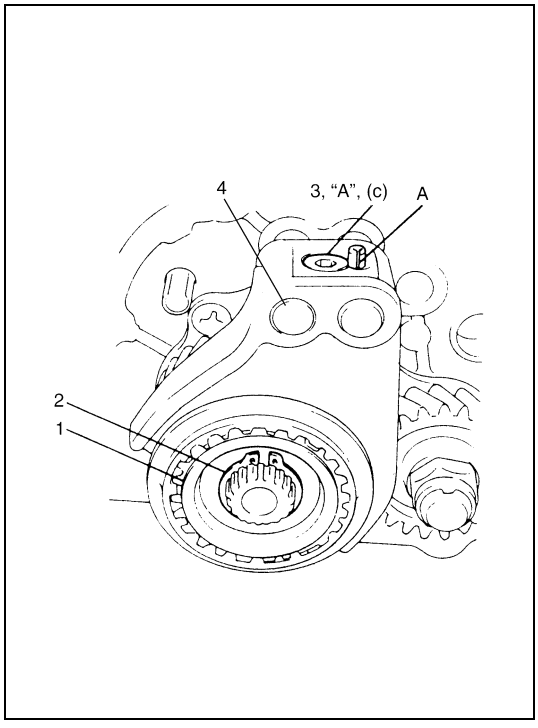


10) Remove special tool, then caulk nut at C with caulking tool and hammer.
11) Install synchronizer ring (2).
12) Fit 5th gear shift fork (1) to sleeve & hub assembly (3) and install them into input shaft, shift shaft and shift guide shaft at once aligning hub oil groove A with shaft mark B.

NOTE:

Long flange of hub faces inward (gear side).

A :	Oil groove (Align with B)
B :	Punch mark
C :	Caulking



13) Drive in spring pin facing its slit A outward.
14) If equipped, install steel ball, tighten shift fork plug (3) to which thread lock cement have been applied.

"A" : Thread lock 1322 99000-32110

Tightening torque
5th shift fork plug (c) : 10 N·m (1.0 kg-m, 7.5 lb-ft)

15) Fit hub plate (1) and fix it with circlip (2).
16) If equipped, install circlip (4) to the end of 5th & reverse gear shift guide shaft.

CAUTION:
- **Coat shift fork plug with thread lock cement reasonably. If it is done to much, excess may interfere in ball movement and cause hard shift to 5th speed.**
- **Make sure circlip is installed in shaft groove securely.**

A :	Pin slit (Face outward)

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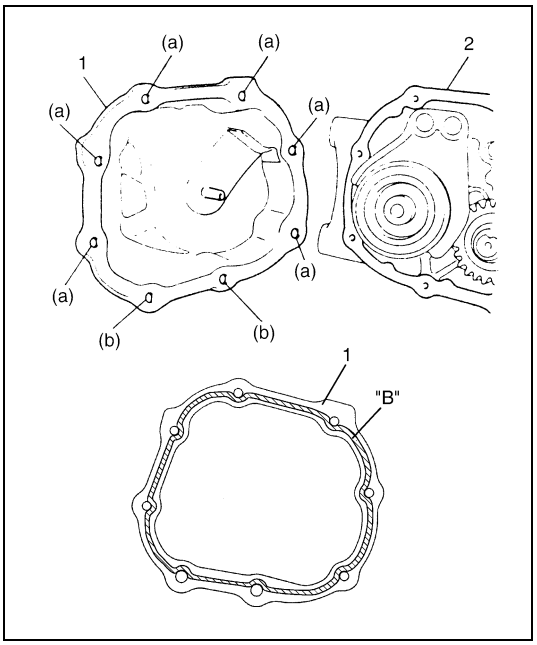
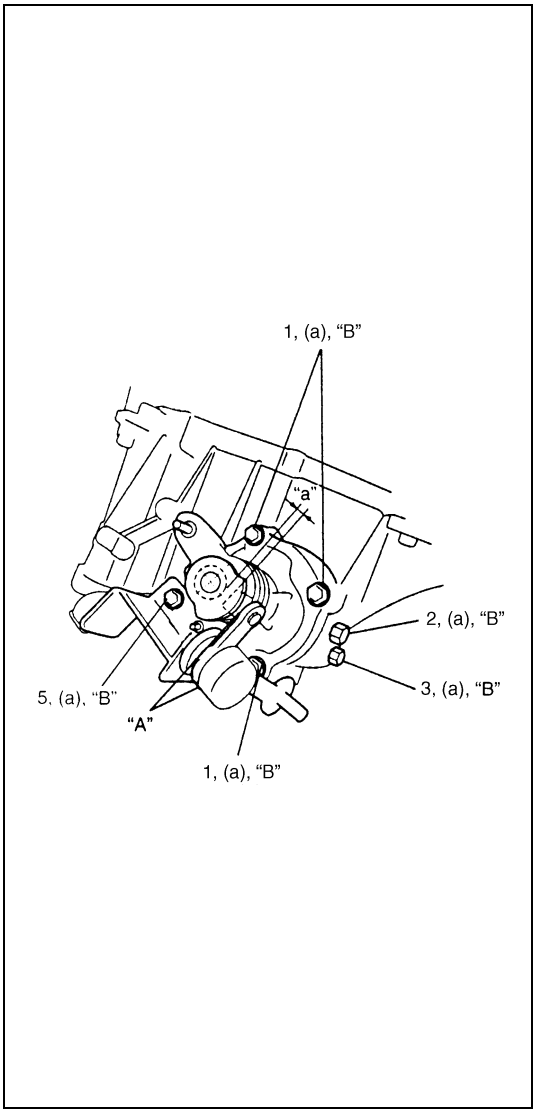


17) Clean mating surface of both left case (2) and side cover (1), apply sealant to side cover (1) by using a nozzle as shown in figure by such amount that its section is 1.5mm (0.059 in.) in diameter, mate it with left case and then tighten bolts.

"B" : Sealant 99000-31110

Tightening torque
Side cover No.1 bolts (a) : 10 N·m (1.0 kg-m, 7.5 lb-ft)
Side cover No.2 bolts (b) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

GEAR SHIFT AND SELECT SHAFT ASSEMBLY



1) Clean mating surface of guide case.
2) Apply grease to select lever shaft bush and select lever boss, and install gear shift and select shaft assembly with new gasket into transmission.

"A" : Grease 99000-25010

3) Apply sealant to gear shift guide case No. 2 bolt (5). Tighten gear shift guide case No. 1 bolts (1) and No. 2 bolt (5) to specified torque at the position that clearance "a" is within 1 - 1.5 mm (0.04 - 0.06 in.).

Tightening torque
Guide case bolts (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

4) Install washer and gear shift interlock bolt (2) to which sealant have been applied and them tighten it to specified torque.

"B" : Sealant 99000-31110

Tightening torque
Gear shift inter lock bolt (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

5) Install washer and 5th to reverse interlock guide bolt (3) to which sealant have been applied and then tighten it to specified torque.

"B" : Sealant 99000-31110

Tightening torque
5th to reverse interlock guide bolt (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

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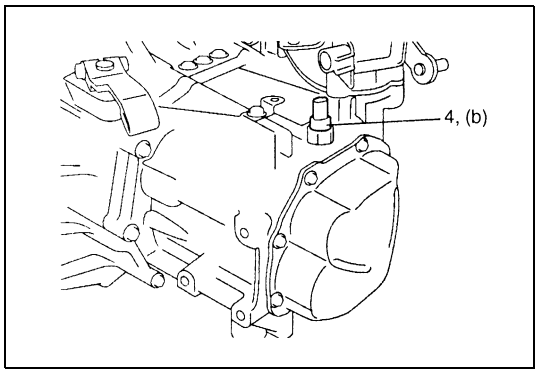

6) Tighten backup lamp switch (1) to specified torque.

Tightening torque
Backup lamp switch (b) : 19 N·m (1.9 kg-m, 14.0 lb-ft)

7) Check input shaft for rotation in each gear position.
8) Also confirm function of back up light switch in reverse position by using ohmmeter.

TIGHTENING TORQUE SPECIFICATION

Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
Transmission oil level/filler and drain plugs	21	2.1	15.5
Oil gutter bolt	10	1.0	7.5
Final gear bolts	90	9.0	65.0
Reverse gear shift lever bolts	23	2.3	17.0
Transmission case bolts	19	1.9	14.0
Reverse shaft bolt	23	2.3	17.0
Locating spring bolts	13	1.3	9.5
Left case plate screw	9	0.9	6.5
Countershaft nut	60	6.0	43.5
5th shift fork plug	10	1.0	7.5
Side cover No.1 bolts	10	1.0	7.5
Side cover No.2 bolts	23	2.3	17.0
Guide case bolts	23	2.3	17.0
Gear shift interlock bolt	23	2.3	17.0
5th to reverse interlock guide bolt	23	2.3	17.0
Backup lamp switch	19	1.9	14.0

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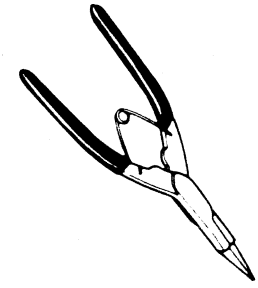
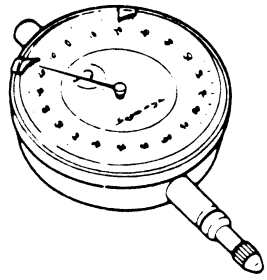
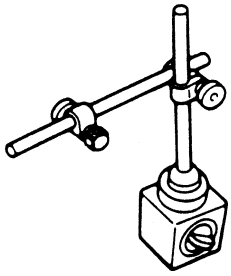
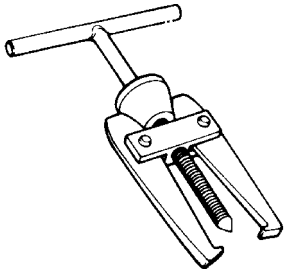
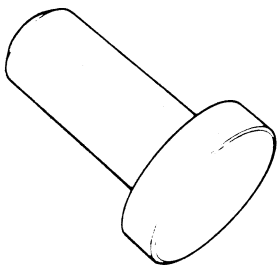
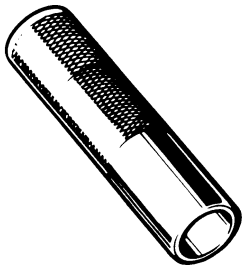
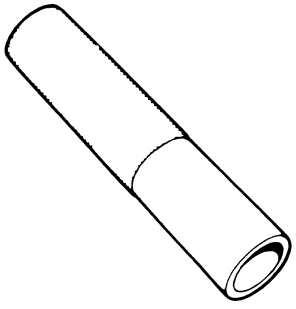
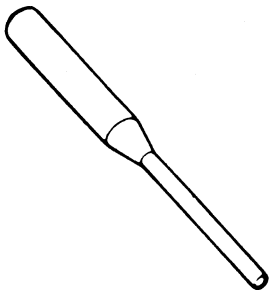
REQUIRED SERVICE MATERIAL

Material	Recommended SUZUKI product (Part Number)	Use
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	• Oil seal lips • O-rings • Select lever boss • Select lever shaft bush • Gear shift control cable end
Sealant	SUZUKI BOND NO.1215 (99000-31110)	• Oil drain plug and filler/level plug • Locating spring bolts • Mating surface of transmission case • Mating surface of side cover • Gear shift interlock bolt • 5th to reverse interlock guide bolt
Thread lock cement	THREAD LOCK 1322 (99000-32110)	• Reverse gear shift lever bolts • Oil gutter bolt • Shift fork plug • Reverse shaft bolt • Final gear bolts

SPECIAL TOOL

 09900-06107 Snap ring pliers (Opening type)	 09900-20606 Dial gauge	 09900-20701 Magnetic stand	 09913-60910 Bearing puller
 09913-75510 Bearing installer	 09913-80112 Bearing installer	 09913-84510 Bearing installer	 09922-85811 Spring pin remover 4.5 mm

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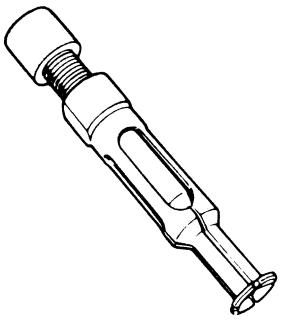
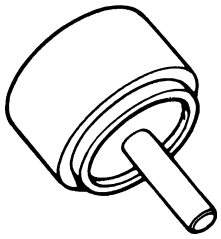
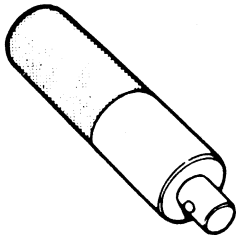
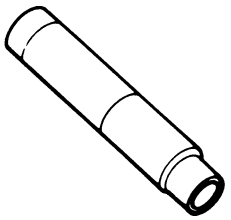
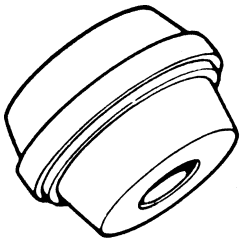
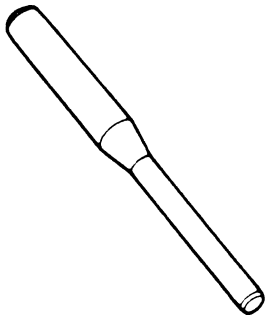
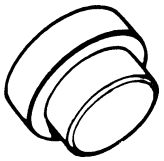
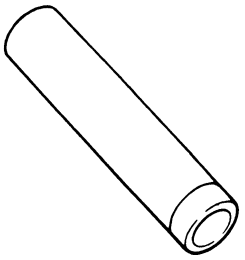
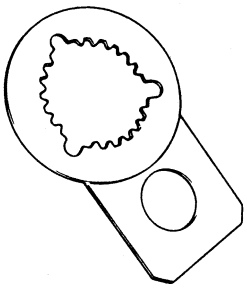
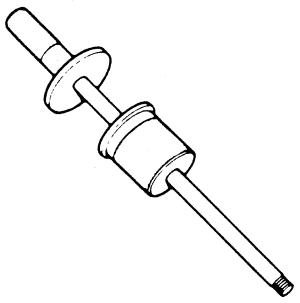
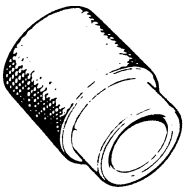
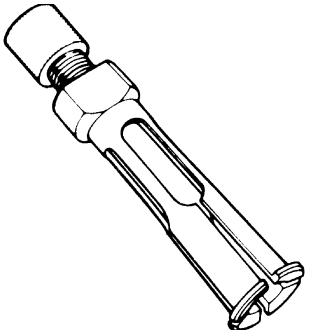
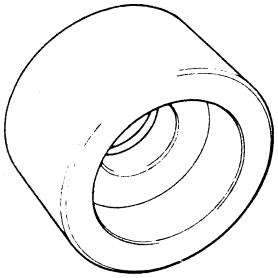
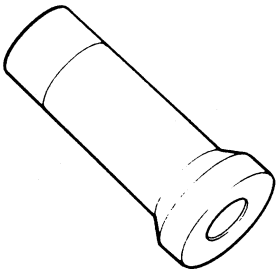
 09923-74510 Bearing remover	 09923-78210 Bearing installer	 09924-74510 Installer attachment	 09925-18011 Bearing installer
 09925-68210 Bearing outer race installer	 09925-78210 Spring pin remover 6 mm	 09925-88210 Bearing puller attachment	 09925-98221 Bearing installer
 09927-76010 Gear holder	 09930-30104 Sliding shaft	 09940-53111 Bearing installer	 09940-54910 Sensor rotor installer
 09941-64511 Bearing remover	 09951-16060 Bush remover	 09951-76010 Bearing installer	

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SECTION 7B

AUTOMATIC TRANSMISSION (4 A/T)

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System :

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

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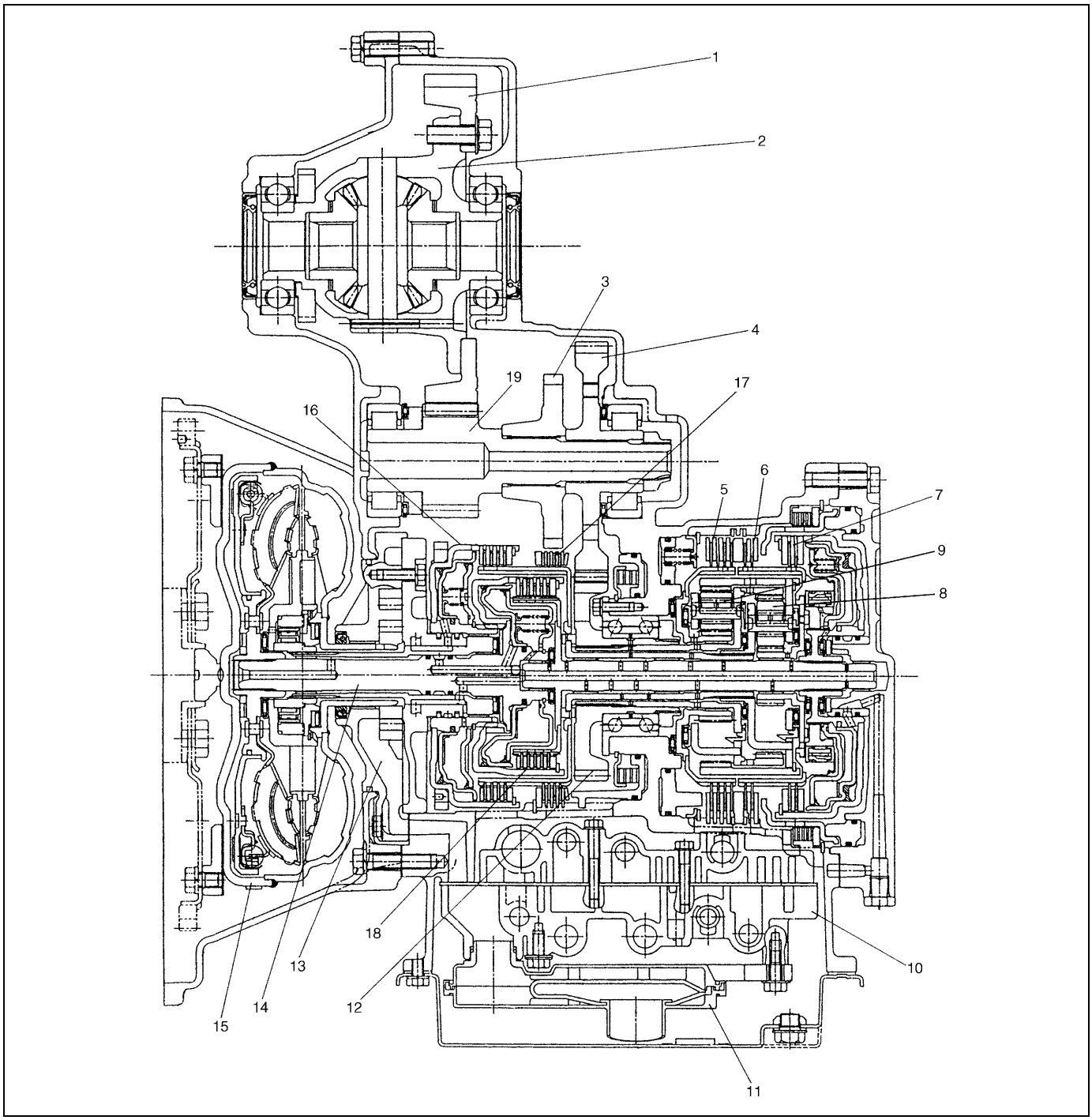
GENERAL DESCRIPTION

This automatic transmission is a full automatic type with 3-speed plus overdrive (O/D).
The torque converter is a 3-element, 1-step and 2-phase type equipped with lock-up mechanism. The gear shift device consists of 2 sets of planetary gear units, sets of 3 disc type clutches, 3sets of disc type brakes and one-way clutch. The gear shift is done by selecting one of 6 positions (“P”, “R”, “N”, “D”, “2” and “L”) by means of the select lever installed on the floor. On the shift knob, there is an overdrive (O/D) cut switch which allows shift-up to the overdrive mode and shift-down from the overdrive mode.



1. Final gear	6. Overdrive brake (B0)	11. Oil strainer	16. Front clutch (C2)
2. Differential gear assembly	7. Direct clutch (C0)	12. Counter drive gear (Reduction gear)	17. Reverse brake (B2)
3. Parking gear	8. Rear planetary gear	13. Oil pump	18. Rear clutch (C1)
4. Counter driven gear (Reduction gear)	9. Front planetary gear	14. Input shaft	19. Differential drive pinion shaft
5. 1st and 2nd brake (B1)	10. Valve body assembly	15. Torque converter	

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Item			Specifications		
Torque converter	Type Stall torque ratio		3-element, 1-step, 2-phase type 1.65 –1.85		
Oil pump	Type Drive system		Internal gear type oil pump Engine driven		
Gear change device	Type		Forward 4-step, reverse 1-step planetary gear type		
	Shift position		“P” range “R” range “N” range “D” range (O/D ON) “D” range (O/D OFF) “2” range “L” range	Gear in neutral, output shaft fixed, engine start Reverse Gear in neutral, engine start Forward 1st ↔ 2nd ↔ 3rd ↔ 4th (O/D) automatic gear change Forward 1st ↔ 2nd ↔ 3rd ← 4th automatic gear change Forward 1st ↔ 2nd ← 3rd automatic gear change Forward 1st ← 2nd reduction, and fixed at 1st gear	
	Gear ratio	1st	2.962	Number of teeth	Front sun gear : 34 Rear sun gear : 21 Front pinion gear : 16 Rear pinion gear : 19 Front internal gear : 66 Rear internal gear : 59
		2nd	1.515		
		3rd	1.000		
		4th (overdrive gear)	0.737		
		Reverse (reverse gear	2.809		
	Control elements		Wet type multi-disc clutch ... 3 sets One-way clutch ... 1 set Wet type multi-disc brake ... 3 sets		
	Reduction gear ratio		1.209		
	Final gear ratio (Differential)		3.578 (for 2WD vehicle), 3.894 (for 4WD vehicle)		
Lubrication	Lubrication system		Force feed system by oil pump		
Cooling	Cooling system		Water-cooled		
Fluid used			Equivalent of DEXRON®-III or DEXRON®-IIE		

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FUNCTIONS

NOTE:

For operation of each part, refer to TABLE OF COMPONENT OPERATION.

PART NAME	FUNCTION
Rear clutch	Meshes input shaft and rear sun gear through one-way clutch.
Front clutch	Meshes input shaft and front internal gear and rear carrier.
Overdrive brake	Fixes rear sun gear.
1st & 2nd brake	Fixes front sun gear.
Reverse brake	Fixes front internal gear and rear carrier.
Direct clutch	Meshes input shaft and rear sun gear.

TABLE OF COMPONENT OPERATION

Selector position / Gear position / Part		Rear clutch	Front clutch	Overdrive brake	1st & 2nd brake	Reverse brake	Direct clutch	One-way clutch
P		○	×	×	×	×	○	×
R		○	×	×	×	○	○	○
N		○	×	×	×	×	○	×
D	1st	○	×	×	○	×	×	○
	2nd	○	○	×	○	×	×	×
	3rd	○	○	×	×	×	○	×
	4th(O/D)	×	○	○	×	×	○	×
2	1st	○	×	×	○	×	×	○
	2nd	○	○	×	○	×	×	×
L	1st	○	×	×	○	×	○	○

○ :Operating × :Not operating

TABLE OF SHIFT SOLENOID VALVE OPERATION

Range & Gear	Shift Solenoid Valve				
	A (No.1)	B (No.2)	C (No.3)	D (No.4)	E (No.5)
[P] , [N]	×	×	×	○	×
1st gear of, [D] , [2]	○	×	×	○	○
1st gear of [L]	○	×	×	○	×
2nd gear	○	×	×	×	○
3rd gear	×	×	×	×	×
4th gear	×	○	○	×	×
[R]	×	×	×	×	×

○ :Operating × :Not operating

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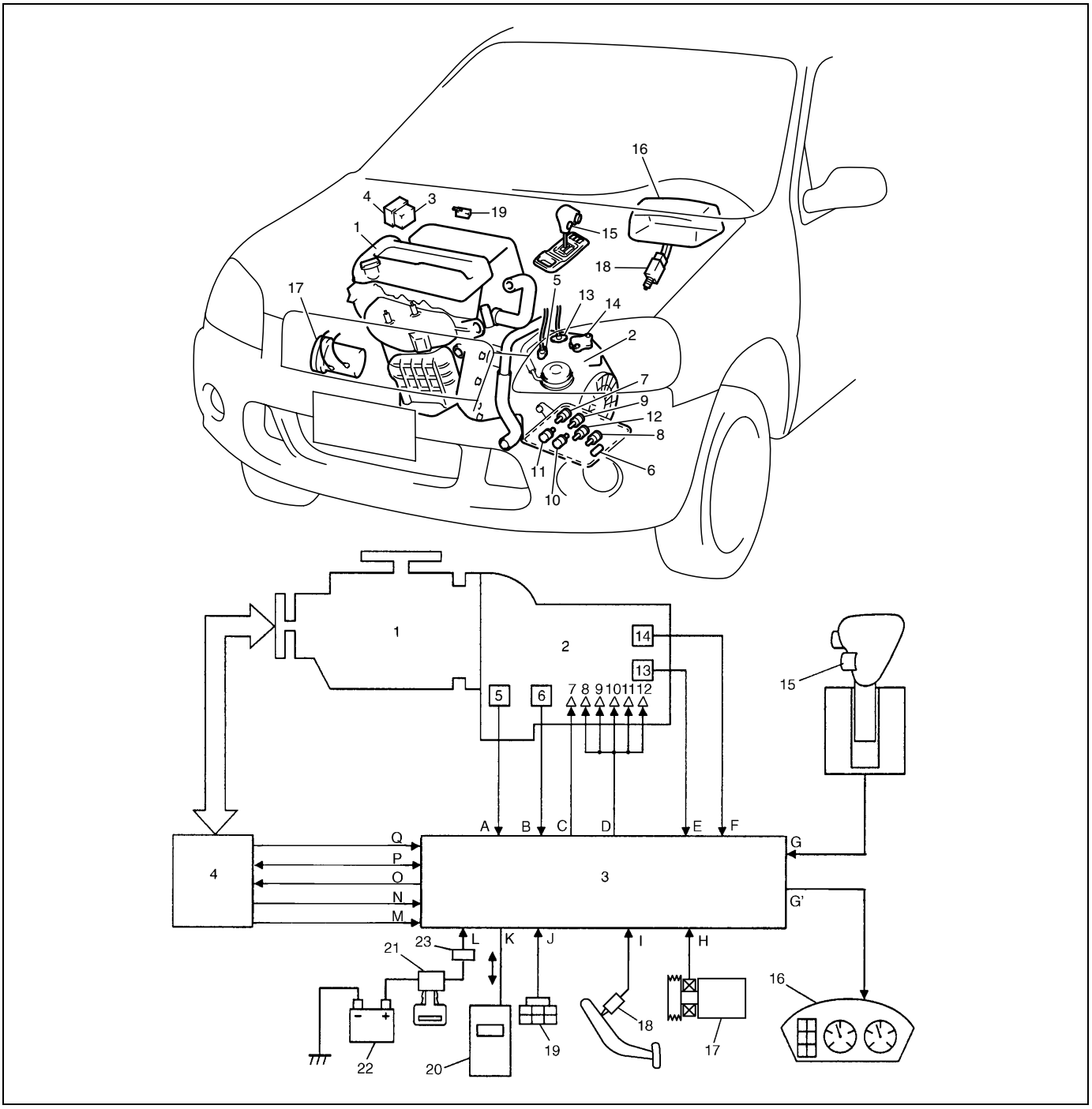
ELECTRONIC SHIFT CONTROL SYSTEM



1. Engine	15. O/D off switch	F. Range signal
2. Transmission	16. Combination meter (O/D off lamp)	G. O/D off switch signal
3. TCM	17. A/C compressor	G'. O/D off lamp signal
4. ECM	18. Brake lamp switch	H. A/C clutch signal
5. Input shaft speed sensor (Turbine rev. sensor)	19. Monitor connector NO. 2	I. Brake signal
6. Transmission temp. sensor (A/T fluid temp. sensor)	20. Suzuki scan tool	J. Diagnosis switch signal
7. TCC solenoid (Lock-up solenoid)	21. Ignition switch	K. Serial communication with Suzuki scan tool
8. Shift solenoid-A (Shift solenoid No.1)	22. Battery	L. Power supply
9. Shift solenoid-B (Shift solenoid No.2)	23. A/T relay	M. Throttle opening signal
10. Shift solenoid-C (Shift solenoid No.3)	A. Turbine speed signal	N. Engine coolant temp./Barometric pressure signal
11. Shift solenoid-D (Shift solenoid No.4)	B. A/T fluid temp signal	O. Idle up signal
12. Shift solenoid-E (Shift solenoid No.5)	C. TCC (lock-up) control signal	P. A/T failure signal
13. Output shaft speed sensor (A/T VSS)	D. Shift control signal	Q. Engine speed (rev.) signal.
14. Transmission range sensor (Shift switch)	E. A/T output shaft speed signal	

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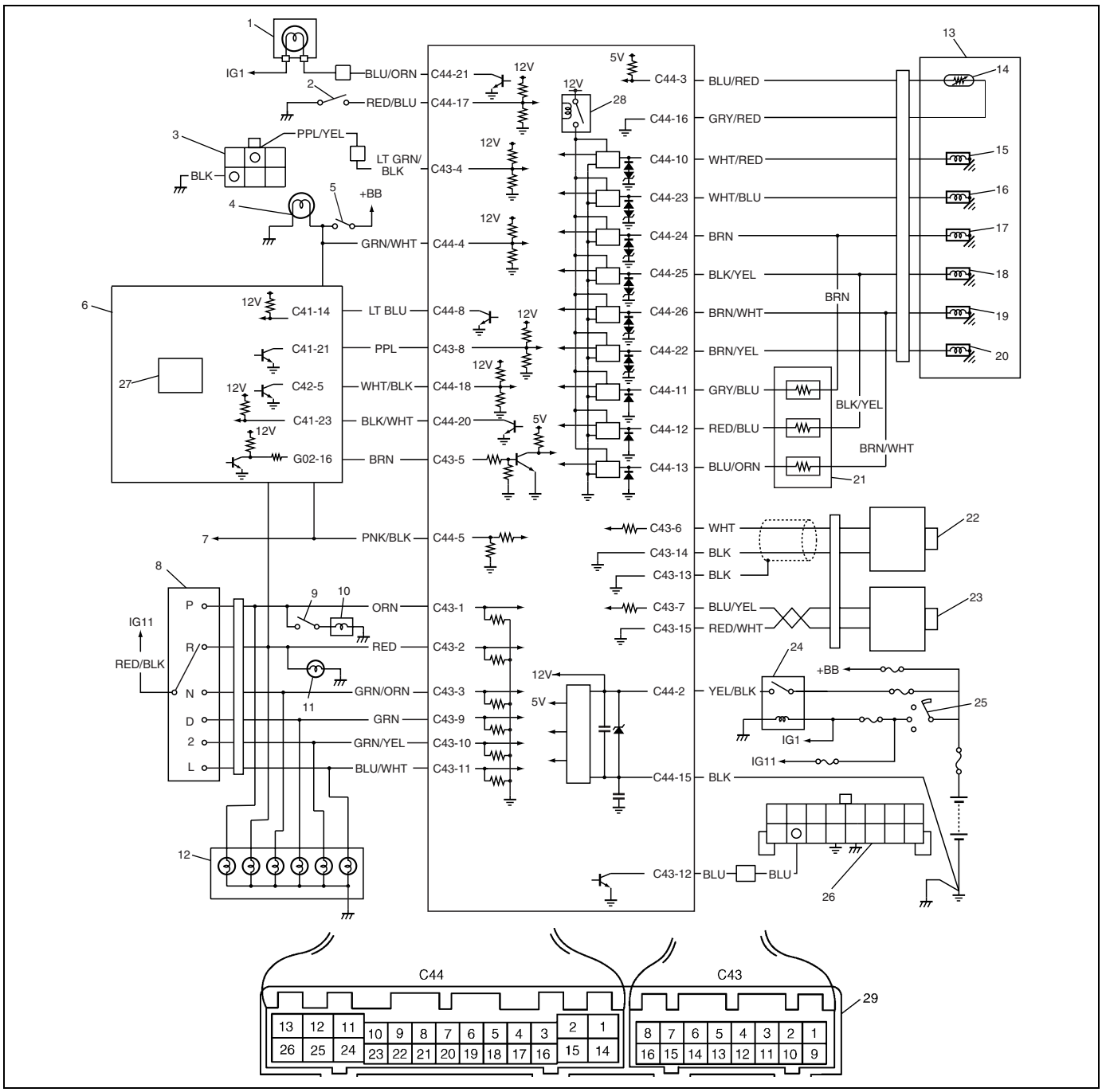
TRANSMISSION CONTROL MODULE (TCM)

TCM is an electronic circuit component that controls gear shift, idle-up according to the signal from each sensor. Also it has learning control function for performing optimum control. It is a microcomputer consisting of an IC, transistor, diode, etc. It is installed behind glove box.



1. "O/D OFF" lamp (in combination meter)	11. Backup lamp	21. Dropping resistor
2. "O/D" off switch	12. Shift indicator (if equipped)	22. Output shaft speed sensor (A/T VSS)
3. Monitor connector No.2	13. A/T	23. Input shaft speed sensor (Turbine rev. sensor)
4. Brake lamp	14. Transmission temperature sensor (A/T fluid temp. sensor)	24. A/T power source relay
5. Brake lamp switch	15. Shift solenoid-A (Shift solenoid No.1)	25. Ignition switch
6. ECM	16. Shift solenoid-B (Shift solenoid No.2)	26. DLC
7. A/C clutch	17. Shift solenoid-C (Shift solenoid No.3)	27. Barometric pressure sensor
8. Transmission range sensor (Shift switch)	18. Shift solenoid-D (Shift solenoid No.4)	28. Solenoid power relay
9. Shift lock solenoid switch (if equipped)	19. Shift solenoid-E (Shift solenoid No.5)	29. Terminal arrangement of TCM coupler (Viewed from harness side)
10. Shift lock solenoid (if equipped)	20. TCC solenoid (Lock-up solenoid)	

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FAIL SAFE FUNCTION

This function is provided by the safe mechanism that assures safe driveability even when the solenoid valve, sensor or its circuit fails.
The table below shows the fail safe function for each fail condition of sensor, solenoid or its circuit.

Area	Detecting condition	Fail safe function
Input/Turbine speed sensor circuit (DTC P0715)	Input shaft speed sensor signal voltage is too high or too low.	• When vehicle running and in shift change by automatic electronic control, gear is fixed to gear which is going to be selected and lock-up function is turned OFF. • When vehicle running and in no shift change, gear is fixed to gear right before the trouble occurred and lock-up function is turned OFF. • When vehicle is at stop after or during detecting trouble, or in shift change by manual operation while running, gear is fixed as the followings and lock-up function is turned OFF. "P" range → P, "R" range → R, "N" range → N, "D" range → 3rd, "2" range → 2nd, "L" range → 1st
Output shaft speed sensor circuit (DTC P0720)	Output shaft speed sensor signal voltage is too high or too low.	
Shift solenoid (DTC P0753) (DTC P0758) (DTC P0763) (DTC P0768) (DTC P0773)	• Solenoid output voltage is too high although TCM orders solenoid to turn off. • Solenoid output voltage is too low although TCM orders solenoid to turn on.	• When select lever is "P", "R", "N", "D" or "2" range, A/T solenoid power relay is turned OFF and gear is fixed as follows : "P" range → P, "R" range → R, "N" range → N, "D" range → 3rd • When select lever is "2" range, gear is fixed to pre programmed gear position of several patterns as follows : – Malfunction of No.1 solenoid → 3rd – Malfunction of No.2 solenoid → 3rd – Malfunction of No.3 solenoid → 2nd – Malfunction of No.4 solenoid → 1st or 2nd – Malfunction of No.5 solenoid → 2nd or 3rd – Malfunction of 2 or more solenoids → 3rd • When select lever is "L" range, gear is fixed to pre programmed gear position of several patterns as follows : – Malfunction of No.1 solenoid → 3rd – Malfunction of No.2 solenoid → 1st – Malfunction of No.3 solenoid → 2nd – Malfunction of No.4 solenoid → 1st or 2nd – Malfunction of No.5 solenoid →1st – Malfunction of 2 or more solenoids → 3rd
TCC circuit (DTC P0743)		Lock-up function is turned OFF.

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Area	Detecting condition	Fail safe function
A/T hardware itself (DTC P0730)	Difference in detected revolution between input shaft speed sensor and output shaft speed sensor is too wide.	"P" range → P, "R" range → R, "N" range → N, "D"/"2"/"L" range "To be controlled as follows : 1) When detecting trouble at first, gear is selected well-suited gear calculated with parameters of each sensor's rev. number and gear position just when the trouble occurred. Lock-up function is turned OFF. 2) If A/T can transmit driving force under the above condition, gear is fixed the selected gear until ignition switch is turned OFF. 3) If A/T can not transmit driving force under the above condition, after once vehicle stop, gear which can transmit drive force is searched one by one until gear is found out. After gear is found out, position of gear is held until ignition switch is turned OFF.
Transmission range sensor circuit (DTC P0705)	No shift switch signal is inputted or two or more shift switch signals are inputted at the same time.	• When vehicle running, shift range position is fixed to shift range position right before the trouble occurred until vehicle stop and lock-up function is turned OFF. • When vehicle is at stop after or during detecting the trouble, gear is fixed as the followings and lock-up function is turned OFF. – When 2 adjoining gear position signals are inputted. "P", "R" range → R, "R", "N" range → R, "N", "D" range → D, "D", "2" range → D, "2", "L" range → 2nd – When 2 or more signals excepting above or no signal are inputted. "P" range → P, "R" range → R, "N" range → N, "D"/"2"/"L" range → 3rd
Transmission temperature sensor circuit (DTC P0710)	• A/T fluid temp. signal input voltage is too low. • A/T fluid temp. signal input voltage does not go down although standard value of engine rev. signal is inputted.	• When detecting circuit open, TCM control as fluid temperature is 100°C (212°F). • Lock-up function is turned OFF.
Engine speed input circuit (DTC P0725)	Inputted engine rev. signal is too low or too high.	• Engine rev. is processed as 4000 rpm. • No compensation or judgement for gear shift control, for which engine rev. is considered, is processed. • Lock-up function is turned OFF.
Engine coolant temp./Barometric pressure signal circuit (DTC P1709)	No or abnormal engine coolant temp. signal is inputted	• No compensation for gear shift control, for which engine coolant temp. and barometric pressure are considered, is processed. • Lock -up function is turned OFF.

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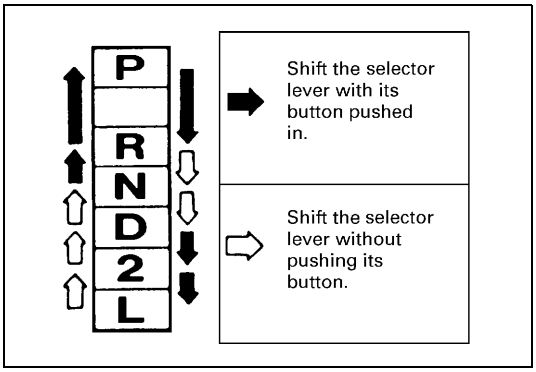
Area	Detecting condition	Fail safe function
Throttle position signal circuit (DTC P1700)	No or abnormal throttle opening signal is inputted	• Scheduling of automatic gear shift is performed as throttle valve opening is 0%. • Control of automatic gear shift (i.e. control of oil pressure) is performed as throttle valve opening is 100%. • Coast down shifting is performed when brake is applied and engine rev. is less than 1,500 rpm. • Lock-up function is turned OFF.
Transmission control system electrical (DTC P0702)	Solenoid power supply relay output voltage is too high although TCM orders relay to turn off or relay output voltage is too low although TCM orders relay to turn on.	• When relay shorted, the gear is fixed as the followings and lock-up function is turned OFF. "P" range → P, "R" range → R, "N" range → N, "D" range → 3rd, "2" range → 2nd, "L" range → 1st • When relay open, power supply to all solenoids is cut and the gear is fixed as the followings. Lock-up function is turned OFF. "P" range → P, "R" range → R, "N" range → N, "D"/"2"/"L" range → 3rd
Internal malfunction of TCM (DTC P1702)	Incorrect calculations of checking TCM programmed data indicated.	Power supply to all solenoid is cut and the gear is fixed as follows : "P" range P, "R" range R, "N" range N, "D"/"2"/"L" range "3rd

CHANGE MECHANISM



The same select pattern shift lever is used as the floor type and frequently used "N" and "D" ranges are made selectable freely.

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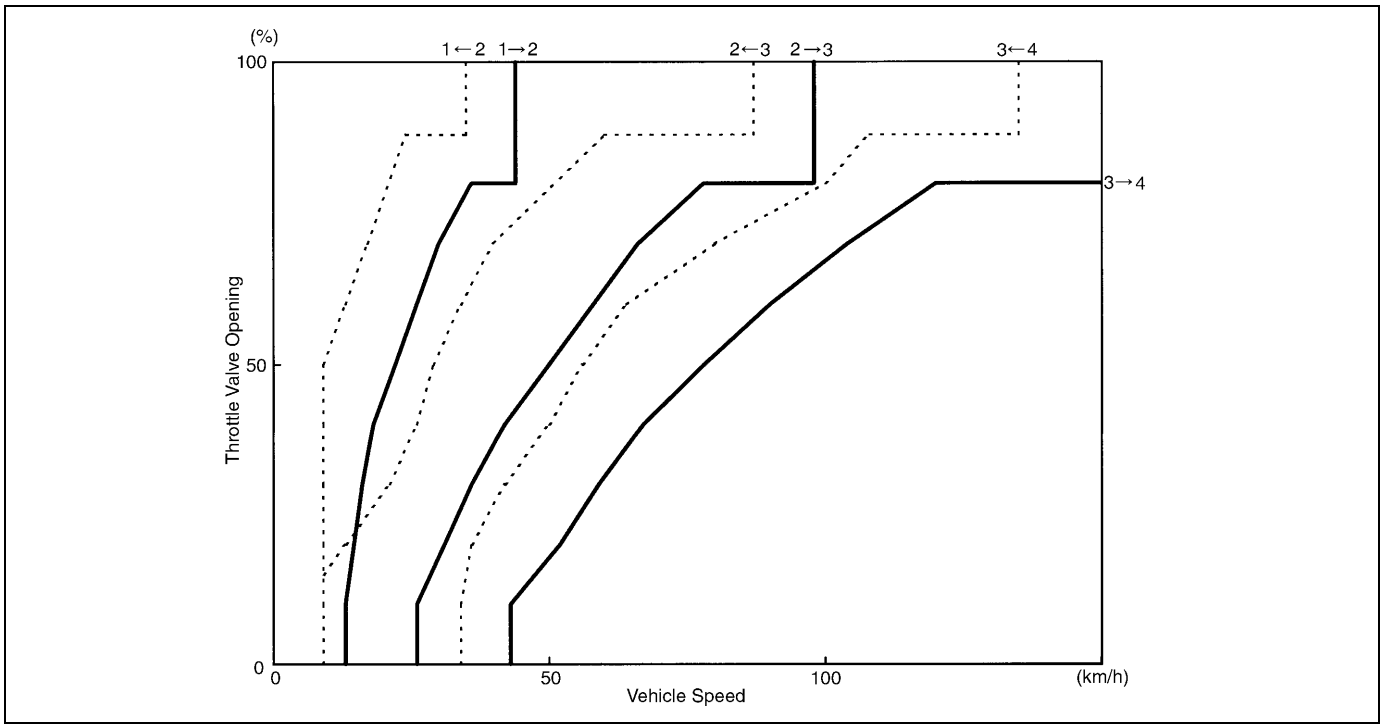
AUTOMATIC GEAR SHIFT DIAGRAM

Automatic shift schedule as a result of shift control is shown below.

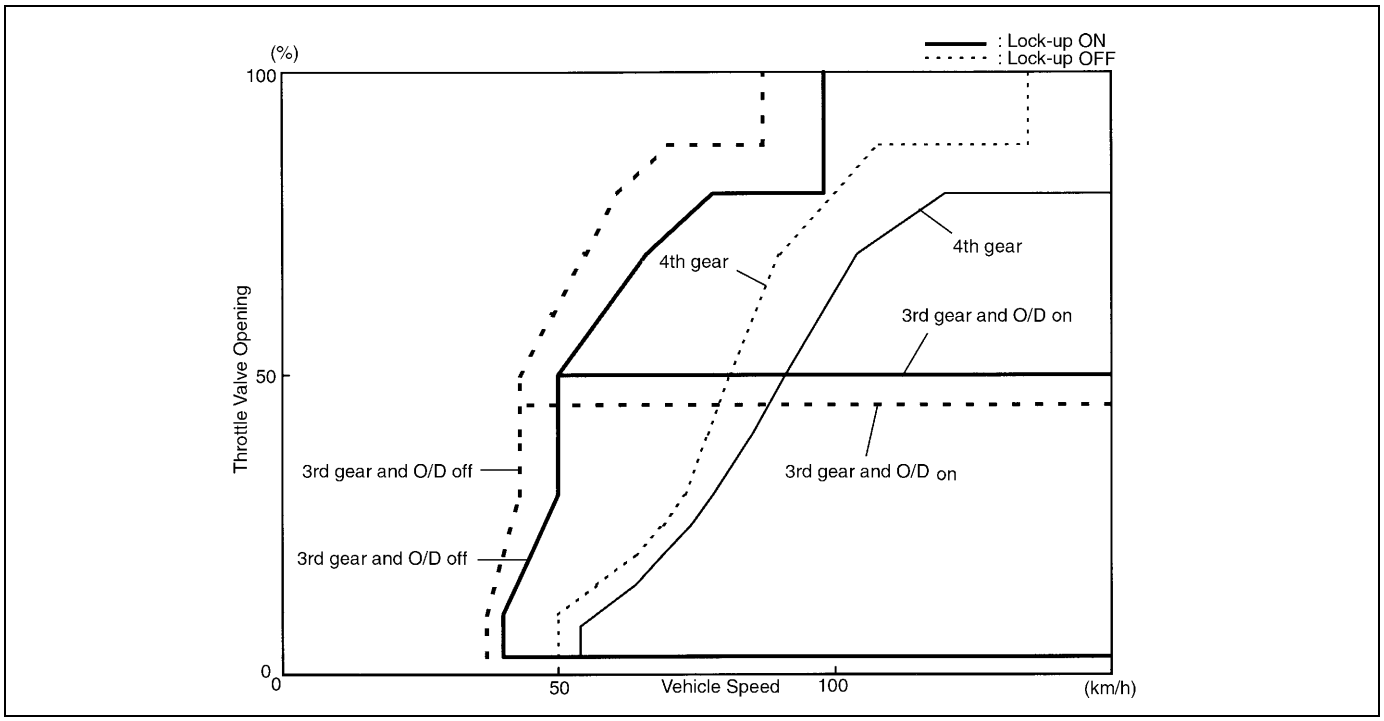
[For 2WD model]

	Shift					
Throttle opening	1→2	2→3	3→4	4→3	3→2	2→1
Full throttle	44	98	-	135	87	35
Closed throttle	13	26	43	34	9	9

Gear Shift Diagram



TCC Lock-up Diagram



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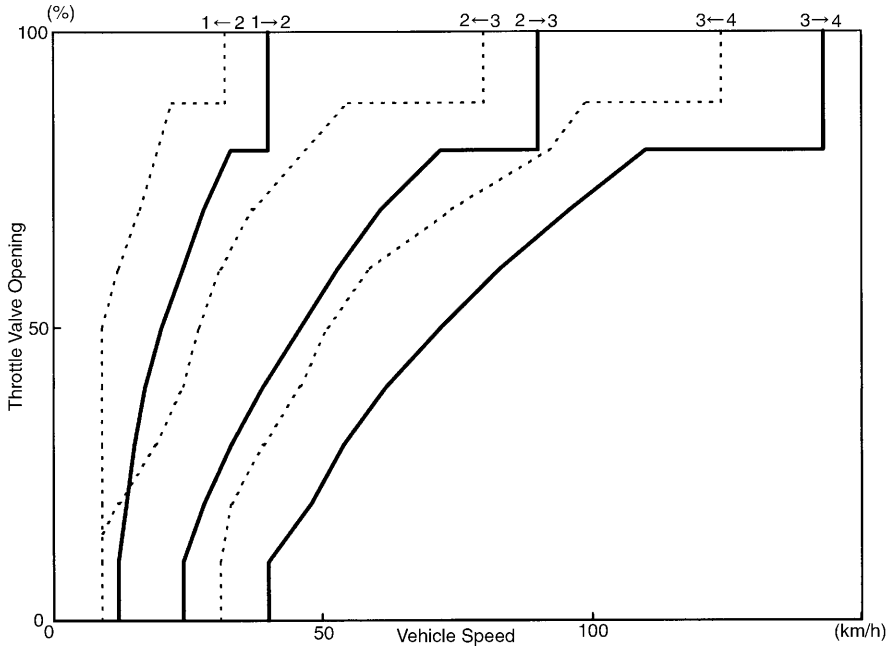
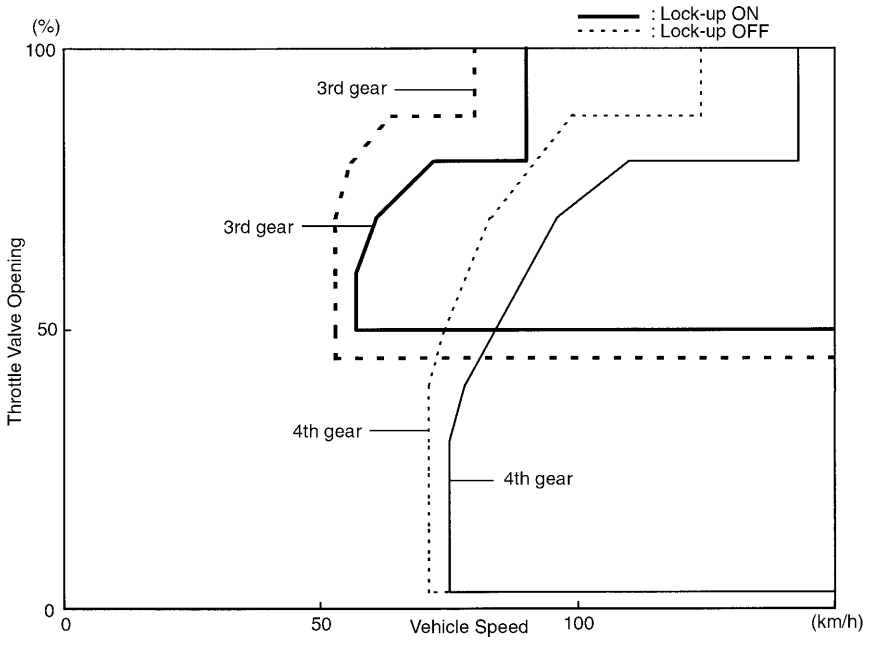
[For 4WD model]

	Shift					
Throttle opening	1→2	2→3	3→4	4→3	3→2	2→1
Full throttle	40	90	143	124	80	32
Closed throttle	12	24	40	31	9	9

Gear Shift Diagram



TCC Lock-up Diagram



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DIAGNOSIS

This vehicle is equipped with an electronic transmission control system, which controls the automatic shift up and shift down timing, etc. suitably to vehicle driving conditions.
When diagnosing a trouble in the transmission including this system, follow “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE” given below to obtain correct result smoothly.

AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE

NOTE:

For the details of each step, refer to the following pages.

Step	Action	Yes	No
1	Customer Complaint Analysis 1) Perform customer complaint analysis referring to the following page. Was customer complaint analysis performed according to instruction on the following page?	Go to Step 2.	Perform customer complaint analysis.
2	Diagnostic Trouble Code (DTC) Check, Record and Clearance 1) Check for DTC referring to the following page. Is there any DTC(s)?	1) Print DTC or write it down and clear it by referring to “DTC CLEARANCE” in this section. 2) Go to Step 3.	Go to Step 4.
3	Visual Inspection 1) Perform visual inspection referring to the following page. Is there any faulty condition?	1) Repair or replace malfunction part. 2) Go to Step 11.	Go to Step 5.
4	Visual Inspection 1) Perform visual inspection referring to the following page. Is there any faulty condition?		Go to Step 8.
5	Trouble Symptom Confirmation 1) Confirm trouble symptom referring to the following page. Is trouble symptom identified?	Go to Step 6.	Go to Step 7.
6	Rechecking and Record of DTC. 1) Recheck for DTC referring to “DTC CHECK” in this section. Is there any DTC(s)?	Go to Step 9.	Go to Step 8.
7	Rechecking and Record of DTC. 1) Recheck for DTC referring to “DTC CHECK” in this section. Is there any DTC(s)?	Go to Step 9.	Go to Step 10.

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Step	Action	Yes	No
8	Automatic Transmission Basic Check and Trouble Diagnosis Table 1) Check and repair according to “A/T BASIC CHECK” and “TROUBLE DIAGNOSIS TABLE” in this section. Are check and repair complete?	Go to Step 11.	1) Check and repair malfunction part(s). 2) Go to Step 11.
9	Troubleshooting for DTC 1) Check and repair according to applicable DTC Diagnostic Flow Table. Are check and repair complete?		
10	Check for Intermittent Problems 1) Check for intermittent problems referring to the following page. Is there any faulty condition?	1) Repair or replace malfunction part(s). 2) Go to Step 11.	Go to Step 11.
11	Final Confirmation Test 1) Clear DTC if any. 2) Perform final confirmation test referring to the following page. Is there any problem symptom, DTC or abnormal condition?	Go to Step 6.	End.

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1. CUSTOMER COMPLAINT ANALYSIS

Record details of the problem (failure, complaint) and how it occurred as described by the customer. For this purpose, use of such a questionnaire form as shown below will facilitate collecting information to the point required for proper analysis and diagnosis.

CUSTOMER QUESTIONNAIRE (EXAMPLE)

User name:	Model:	VIN:	
Date of issue:	Date Reg.	Date of problem:	Mileage:
DESCRIPTION OF PROBLEM			
Engine does not start		Engine stops	
Vehicle does not move (forward, rearward)		Transmission does not shift (1st, 2nd, 3rd, 4th, Rev) gear	
No lock-up (Lock-up clutch operation)		Automatic shift does not occur	
Shift point too high or too low		Transmission slipping in (1st, 2nd, 3rd, 4th, Rev) gear	
Excessive gear change shock		Other	
VEHICLE/ENVIRONMENTAL CONDITION WHEN PROBLEM OCCURS			
Environmental Condition			
Weather	fair/cloudy/rain/snow/always/other( )		
Temperature	hot/warm/cool/cold/( ) °C/always		
Frequency	always/sometimes (times/ day, month)/only once		
Road	urban/suburb/highway/mountainous (uphill/downhill)/tarmacadam/gravel/other( )		
Vehicle Condition			
Transmission range	(P, R, N, D, 2, L) range/(→) range		
Transmission temp.	cold/warming up phase/warmed up		
Vehicle	at stop/during driving (constant speed/accelerating/decelerating/right hand corner/left hand corner)/other ( )/speed (km/h)		
Engine	Speed (r/min)/throttle opening (idle/about %/full)		
Brake	Apply/Not apply		
"O/D OFF" switch	ON/OFF		
MALFUNCTION INDICATOR LAMP FUNCTION			
always ON/sometimes ON/not on			
Diagnostic trouble code indicated/not indicated			
Diagnostic trouble code recorded			

NOTE:

The above form is a standard sample. It should be modified according to conditions characteristic of each market.

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2. DIAGNOSTIC TROUBLE CODE (DTC) CHECK, RECORD AND CLEARANCE

To check DTC, refer to “DTC CHECK” in this section. When a DTC exists, it means existence of a malfunction in the system represented by that code but whether it still exists (current) or it occurred in the past and has gone (history) is unknown. To know it, clear this DTC once (Refer to “DTC CLEARANCE” in this section.), perform test drive and/or “TROUBLE SYMPTOM CONFIRMATION” in this section and then check DTC again as described in “DTC CHECK”. Attempt to diagnose the trouble based on the DTC recorded in this step only or failure to clear the DTC in this step may mislead the diagnosis or make diagnosing difficult. Even after checking the DTC with the SUZUKI scan tool, diagnosis should be performed according to this flow chart to check TCM for proper self-diagnosis function.

3 and 4. VISUAL INSPECTION

As a preliminary step, perform visual check of the following items that support proper function of the automatic transmission.

INSPECTION ITEM	REFERRING SECTION
• Engine oil ----- level, leakage	Section 0B
• Engine coolant ----- level, leakage	Section 0B
• A/T fluid ----- level, leakage, color	Section 0B
• Battery ----- fluid level, corrosion of terminal	
• A/T fluid hoses ----- disconnection, looseness, deterioration	
• Connectors of electric wire harness ----- disconnection, friction	Section 8
• Fuses ----- burning	Section 8
• Parts ----- installation, bolt ----- looseness	
• Parts ----- deformation	
• Other parts that can be checked visually	
Also add following items at engine start.	
• Indicator, warning lights in combination meter ----- ON (indicating abnormality in system) or OFF	Section 8C
• Other parts that can be checked visually	

5.TROUBLE SYMPTOM CONFIRMATION

Check if what the customer claimed in “CUSTOMER COMPLAINT ANALYSIS” is actually found in the vehicle and if that symptom is found, whether it is identified as a failure. (This step should be shared with the customer if possible.)

When the symptom is not actually found, possibility is :

- The symptom occurs under certain conditions.
  ----- Retry with the vehicle under different conditions.
- The trouble occurred only temporarily and normal operation has been restored.
  ----- Perform “DTC CHECK” and if the diagnostic trouble code is indicated, inspect according to the flow table for that DTC.

6 and 7. RECHECKING AND RECORD OF DTC

Refer to “DTC CHECK” in this section.

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8. AUTOMATIC TRANSMISSION BASIC CHECK AND TROUBLE DIAGNOSIS TABLE

Perform basic automatic transmission check according to the list below first. When the end of the list has been reached, check the part of system suspected as a possible cause referring to “TROUBLE DIAGNOSIS TABLE” and based on symptoms appearing on vehicle (symptoms obtained through steps of customer complaint analysis, trouble symptom confirmation and/or A/T basic check) and repair or replace faulty parts, if any.

AUTOMATIC TRANSMISSION BASIC CHECK LIST

1) Power Supply Voltage Check
   Check that the battery voltage is within 10 – 14 V at engine stop.
2) A/T Fluid Check
   Check A/T fluid level and quality.
3) STALL TEST
   Perform stall test. Refer to “STALL TEST” in this section for details.
4) LINE PRESSURE TEST
   Perform line pressure test. Refer to “LINE PRESSURE TEST” in this section.
5) ROAD TEST
   Perform road test to understand correctly the trouble area.
6) Electrical Harness and Coupler Check
   Check the connection of the harness coupler. Check for the loose connection of the harness, loose connection of the terminals.

9. DIAGNOSTIC TROUBLE CODE FLOW TABLE

Based on the DTC indicated in STEP 6 and STEP 7 and referring to “DTC CHECK”, locate the cause of the trouble, namely in a sensor, switch, wire harness, connector, actuator, TCM or other part and repair or replace faulty parts.

10. CHECK FOR INTERMITTENT PROBLEM

Check parts where an intermittent trouble is easy to occur (e.g. wire harness, connector, etc.), referring to “INTERMITTENT AND POOR CONNECTION” in Section 0A and related circuit of DTC recorded in Step 2.

11. FINAL CONFIRMATION TEST

Confirm that the problem symptom has gone and the automatic transmission is free from any abnormal conditions. If what has been repaired is related to the malfunction DTC, clear the DTC once and perform test driving and confirm that a normal code is indicated.

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TROUBLE DIAGNOSIS TABLE

NOTE:

For the inspection of throttle position sensor, refer to "TP SENSOR" in Section 6E.

TABLE 1 (ELECTRICAL)

Condition		Possible Cause	Correction
No up-shift	1st → 2nd 2nd → 3rd	• Output shaft speed sensor or its circuit faulty	Inspect output shaft speed sensor.
		• Shift solenoid -D (No.4) (1st → 2nd), -A (No.1) (1st → 3rd), -E (No.5) (2nd → 3rd), and/or its circuit faulty	Repair or replace.
		• Throttle position sensor or its circuit faulty	Inspect TP sensor.
		• TCM faulty	Replace TCM.
	3rd → 4th	• Output shaft speed sensor or its circuit faulty	Inspect output shaft speed sensor.
		• Shift solenoid -B (No.2), -C (No.3) or its circuit faulty	Repair or replace.
		• O/D CUT switch circuit faulty	Refer to "O/D OFF SWITCH" in this section and/or inspect its circuit.
		• Throttle position sensor or its circuit faulty	Inspect TP sensor.
		• TCM faulty	Replace TCM.
No down-shift	4th → 3rd 3rd → 2nd 2nd →1st	• Shift solenoid -C (No.3) (4th → 3rd), -D (No.4) (2nd → 1st), -A (No.1) (3rd → 2nd), -B (No.2) (4th → 3rd), -E (No.5) (3rd → 2nd) or its circuit faulty	Repair or replace.
		• Throttle position sensor or its circuit faulty	Inspect TP sensor.
		• TCM fault	Replace TCM.
Shift point too high or too low		• Throttle position sensor, output shaft speed sensor or its circuit faulty	Inspect TP sensor and/or output shaft speed sensor.
Vehicle does not move		• Shift solenoid -A (No.1), -C (No.3), -D (No.4) or its circuit faulty	Repair or replace.
Excessive slip		• Shift solenoid -A (No.1) to -E (No.5) or its circuit faulty	Repair or replace.
Excessive shock at N → D or N → R		• Shift solenoid -A (No.1), -D (No.4), -E (No.5) or its circuit faulty	Repair or replace.
		• ISC circuit	Inspect ISC circuit.
No lock-up or No lock-up OFF		• TCC (lock-up) solenoid valve or its circuit faulty	Repair or replace.
		• Throttle position sensor or its circuit faulty	Refer to "THROTTLE POSITION SENSOR" in Section 6E.
		• Input shaft speed and/or output shaft speed sensor or its circuit faulty.	Refer to "ECT SENSOR" in Section 6E.
		• Abnormal engine rev. signal or its circuit.	Repair or replace.
		• ECM faulty	Inspect ECM.

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TABLE 2 (MECHANICAL)

Condition		Possible Cause	Correction
Vehicle does not move at any range		• Manual valve faulty	Clean or replace.
		• Primary regulator valve faulty	Clean or replace.
No gear change	**1st ↔ 2nd**	• Shift solenoid -D (No.4) and/or -E (No.5) stuck	Clean or replace.
	2nd ↔ 3rd	• Shift solenoid -A (No.1), -C (No.3) and/or fail valve No.1 stuck	Clean or replace.
	3rd ↔ 4th	• Shift solenoid -B (No.2), -C (No.3) and/or fail valve No.2 stuck	Clean or replace.
Harsh engagement	**P, N → R**	• Front clutch accumulator faulty	Clean or replace.
	N → D	• 1st & 2nd brake accumulator faulty	Clean or replace.
	1st → 2nd at D range or 2 range	• Front clutch accumulator faulty	Clean or replace.
		• Shift solenoid -D (No.4)	Clean or replace.
	2nd → 3rd at D range	• Direct clutch accumulator faulty	Clean or replace.
		• Shift solenoid -E (No.5)	Clean or replace.
	3rd → 4th at D range	• Overdrive brake accumulator faulty	Clean or replace.
		• Shift solenoid -B (No.2)	Clean or replace.
	All gear change	• Primary regulator valve faulty	Clean or replace.
Excessive slip (low line pressure)		• Primary regulator valve faulty	Clean or replace.
Vehicle does not move at	**1st, 2nd, 3rd and reverse gear**	• Rear clutch faulty	Repair or replace.
	Reverse gear	• Reverse brake faulty	Repair or replace.
	2nd, 3rd and 4th gear	• Front clutch faulty	Repair or replace.
	3rd and 4th gear	• Direct clutch faulty	Repair or replace.
	1st and 2nd gear	• 1st & 2nd brake faulty	Repair or replace.
	4th gear	• Overdrive brake faulty	Repair or replace.
	Any forward and reverse gear	• Parking lock pawl faulty	Repair or replace.
Shock or engine stalls when starting off and stopping		• TCC (lock-up clutch) faulty	Inspect and replace as necessary.
		• TCC (lock-up) solenoid faulty	Clean or replace.
		• Lock-up control valve faulty	Clean or replace.
		• Lock-up signal valve faulty	Clean or replace.
No up-shift	**1st → 2nd**	• Front clutch faulty	Repair or replace.
	2nd → 3rd	• Direct clutch faulty	Repair or replace.
	3rd → 4th	• Overdrive brake faulty	Repair or replace.
No engine braking	**2nd or 3rd gear**	• Front, rear or direct clutch or 1st & 2nd brake faulty	Repair or replace
	L range 1st gear	• Direct clutch or 1st & 2nd brake faulty	Repair or replace.
No lock-up		• Torque converter clutch faulty	Inspect and replace as necessary.
		• Lock-up control valve faulty	Clean or replace.
		• TCC (lock-up) solenoid faulty	Clean or replace.
		• Secondary regulator valve faulty	Clean or replace.
		• Signal valve faulty	Clean or replace.

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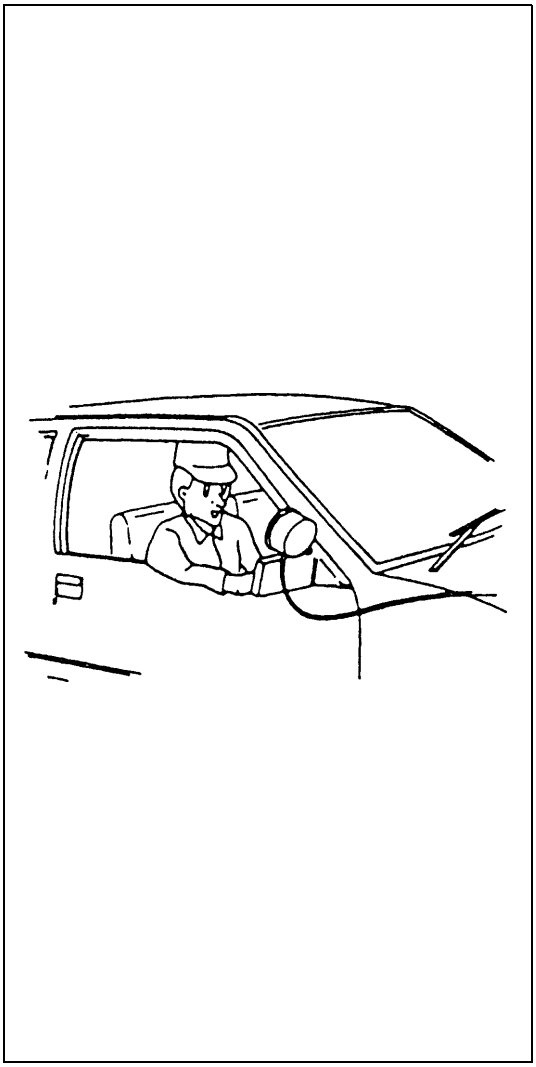
STALL TEST

This test is to check overall performance of automatic transmission and engine by measuring stall speed at “D” and “R” ranges. Be sure to perform this test only when transmission fluid is at normal operating temperature and its level is between FULL and LOW marks.

CAUTION:
- **Do not run engine at stall more than 5 seconds continuously, for fluid temperature may rise excessively high.**
- **After performing stall test, be sure to leave engine running at idle for longer than 30 seconds before another stall test.**



1) Apply parking brake and block wheels.
2) Install tachometer.
3) Start engine with select lever shifted to “P”.
4) Depress brake pedal fully.
5) Shift select lever to “D” and depress accelerator pedal fully while watching tachometer. Read engine rpm quickly when it has become constant (stall speed).
6) Release accelerator pedal immediately after stall speed is checked.
7) In the same way, check stall speed in “R” range.
8) Stall speed should be within following specification.

Stall speed
: 2,750 – 3,150 r/min

Test result	Possible cause
Lower than standard level	• Lack of engine output • Defective torque converter
Higher than standard level in “D” range	• Low line pressure • Malfunctioning 1st & 2nd brake • Malfunctioning rear clutch • Malfunctioning stator one-way clutch
Higher than standard level in “R” range	• Low line pressure • Malfunctioning rear clutch • Malfunctioning reverse brake • Malfunctioning stator one-way clutch • Malfunctioning direct clutch

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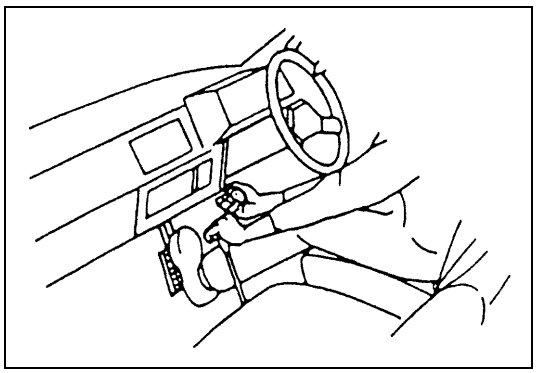
TIME LAG TEST

This test is to check conditions of clutch, reverse brake and fluid pressure. “Time lag” means time elapsed since select lever is shifted with engine idling till shock is felt.



1) With chocks placed in front and behind front and rear wheels respectively, depress brake pedal.
2) Start engine.
3) With stop watch ready, shift select lever from “N” to “D” range and measure time from that moment till shock is felt.
4) Similarly measure time lag by shifting select lever from “N” to “R” range.

Specification for time lag
“N” → “D” : Less than 1.0 sec.
“N” → “R” : Less than 1.2 sec.

NOTE:

- **Make sure that selector cable is properly adjusted.**
- **When repeating this test, be sure to wait at least minute after select lever is shifted back to “N” range.**
- **Engine should be warmed up fully for this test.**

Test result	Possible cause
When “N” → “D” time lag exceeds specification.	• Low line pressure • Worn rear clutch • Worn 1st & 2nd brake
When “N” → “R” time lag exceeds specification.	• Low line pressure • Worn rear clutch • Worn direct clutch • Worn reverse brake

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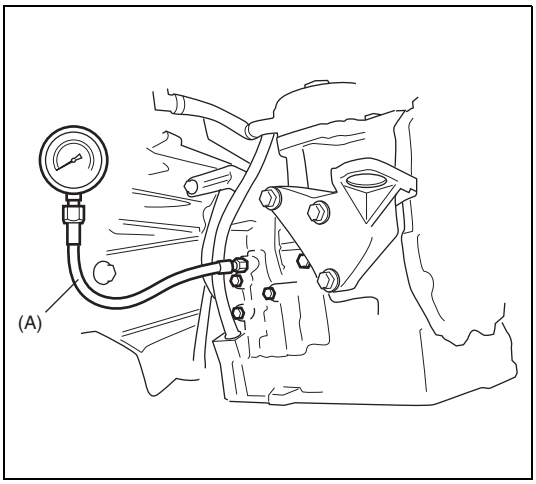
LINE PRESSURE TEST

Purpose of this test is to check operating conditions of each part by measuring fluid pressure in fluid pressure line.
Line pressure test requires following conditions.

- Automatic fluid is at normal operating temperature (70 – 80°C /158 – 176°F).
- Fluid is filled to proper level (between FULL and LOW on dipstick).



1) Apply parking brake securely and place chocks against wheels.
2) Remove fluid pressure check hole plug bolt.
3) Attach oil pressure gauge to fluid pressure check hole in transmission case.

Special tool
(A) : 09925-37811-001

CAUTION:
After attaching oil pressure gauge, check that no fluid leakage exists.

4) Depress foot brake fully, run engine at idle and stall then check fluid pressure in “D” or “R” range.

CAUTION:
Do not continue running engine at stall speed longer than 5 seconds.

Line pressure

	“D” range	“R” range
At idle speed	**7.6 – 9.2 kg/cm^2 108.1 – 130.8 psi**	**14.1 – 17.3 kg/cm^2 200.6 – 246.0 psi**
At stall speed	**7.9 – 9.5 kg/cm^2 112.4 – 135.0 psi**	**14.4 – 17.6 kg/cm^2 204.8 – 250.2 psi**

Test result	Possible cause
Line pressure higher than standard level in each range	• Malfunctioning regulator valve
Line pressure lower than standard level in each rang	• Malfunctioning regulator valve • Defective oil pump
Line pressure lower than standard level only in “D” range	• Fluid leakage from “D” range pressure circuit • Fluid leakage from 1st & 2nd brake • Fluid leakage from rear clutch
Line pressure lower than standard level only in “R” range	• Fluid leakage from “R” range pressure circuit • Fluid leakage from rear clutch • Fluid leakage from direct clutch • Fluid leakage from reverse brake

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ENGINE BRAKE TEST

WARNING:
Before test, make sure that there is no vehicle behind so as to prevent rear-end collision.

1) While driving vehicle in 3rd gear of “D” range, shift select lever down to “2” range and check if engine brake operates.
2) In the same way as in Step 1), check engine brake for operation when select lever is shifted down to “L” range.
3) Engine brake should operate in above test.

Test result	Possible cause
Fails to operate when shifted down to “2” range	• Defective shift switch • 1st & 2nd brake defective • Direct clutch defective
Fails to operate when shifted down to “L” range	

“P” RANGE TEST

1) Stop vehicle on a slope, shift select lever to “P” range and at the same time apply parking brake.
2) After stopping engine, depress brake pedal and release parking brake.
3) Then, release brake pedal gradually and check that vehicle remains stationary.
4) Depress brake pedal and shift select lever to “N” range.
5) Then, release brake pedal gradually and check that vehicle moves.

WARNING:
Before test, check to make sure no one is around vehicle or down on a slope and keep watchful for safety during test.

Test result	Possible cause
Vehicle moves at “P” range or remains stationary at “N” range	Defective parking lock pawl or spring

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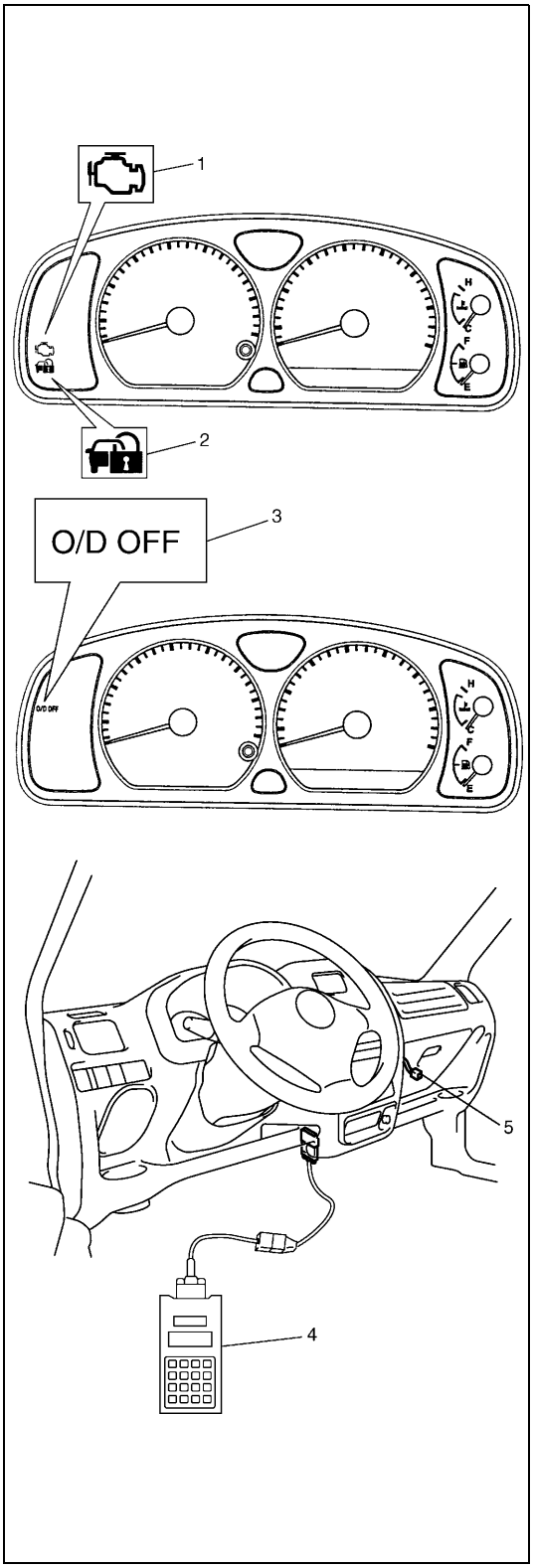
ELECTRONIC CONTROL SYSTEM DIAGNOSIS

TCM has on-board diagnostic system (a system self-diagnosis function). Investigate where the trouble is by referring to “DIAGNOSTIC FLOW TABLE” and “DTC TABLE” in this section.

PRECAUTIONS IN DIAGNOSING TROUBLES



[PRECAUTIONS IN IDENTIFYING DTC]

- For vehicle equipped with immobilizer indicator lamp (2) (which comes on when turning on ignition switch leaving engine OFF), malfunction indicator lamp (MIL) (1) comes on when TCM detects malfunction of automatic transmission system.
- For vehicle equipped without immobilizer indicator lamp (2), malfunction indicator lamp (MIL) (1) does not come on although TCM detects malfunction of automatic transmission system.
- Don’t disconnect couplers from TCM, battery cable from battery, TCM ground wire harness from engine or main fuse before checking DTC stored in TCM memory.
  Such disconnection will clear memorized information in TCM memory.
- Using SUZUKI scan tool (Tech-1) (4), diagnostic trouble code (DTC) stored in TCM memory can be checked and cleared as well.
  Before its use, be sure to read Operator’s (instruction) Manual supplied with it carefully to have good understanding of its functions and usage.
- Not using scan tool, the DTC stored in TCM memory also can be checked and cleared.
  DTC stored in the TCM memory is outputted by flashing of “O/D OFF” lamp (3) with diagnosis switch terminal of monitor connector No.2 (5) grounded.
  If no DTC is stored in TCM memory, DTC No.12 is outputted repeatedly.
  If one or more DTCs are stored in TCM memory, they are outputted starting from smallest code number in increasing order.
  After all DTCs are outputted, all DTCs are outputted repeatedly.
- Be sure to read “PRECAUTIONS FOR ELECTRICAL CIRCUIT SERVICE” in Section 0A before inspection and observe what is written there.
- When replacing TCM with used one, all learned contents which are stored in TCM memory should be erased after the replacement referring to “LEARNING CONTROL INITIALIZATION” in this section.

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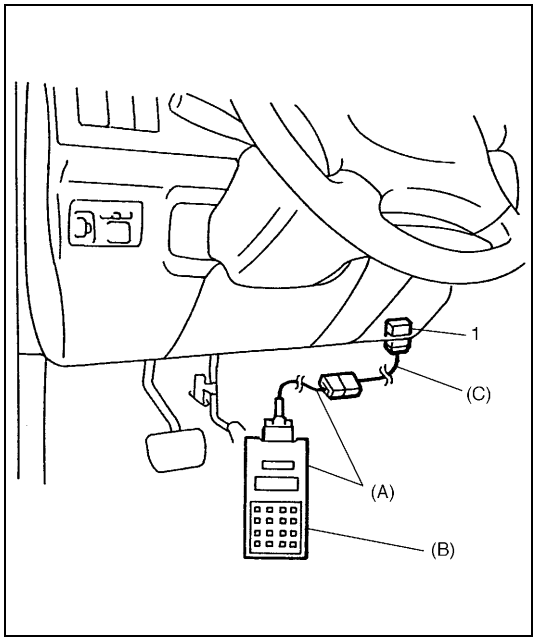
[INTERMITTENT TROUBLES] and [NOTES ON SYSTEM CIRCUIT INSPECTION]
Refer to Section 0A.

DTC CHECK

[Check DTC with SUZUKI scan tool]

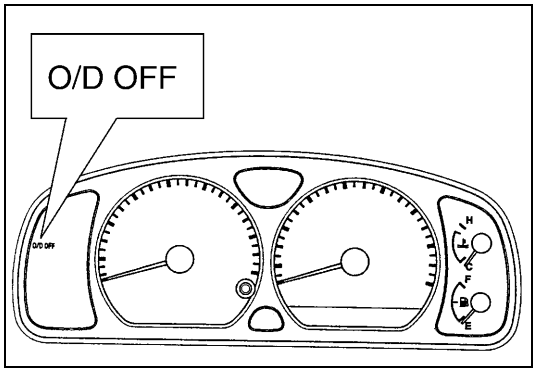


1) Turn ignition switch OFF.
2) After setting cartridge, connect SUZUKI scan tool to data link connector (DLC) (1) located on underside of instrument panel at driver's seat side.

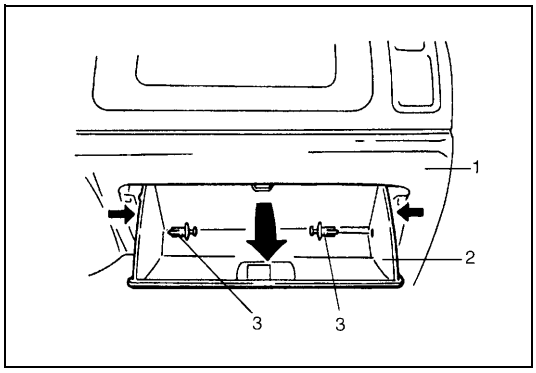
Special tool
(A) : 09931-76011 (SUZUKI scan tool)
(B) : Mass storage cartridge
(C) : 09931-76030 (16/14 pin DLC cable)

3) Turn ignition switch ON.
4) Read DTC according to instructions displayed on SUZUKI scan tool and print it or write it down. Refer to SUZUKI scan tool operator's manual for further details.
5) After completing the check, turn ignition switch OFF and disconnect SUZUKI scan tool from data link connector (DLC) (1).

[Check DTC without SUZUKI scan tool]



1) Turn ignition switch ON and make sure that O/D OFF lamp is OFF in combination meter (O/D off switch OFF).
2) Turn ignition switch OFF.



3) Pull out clip (3) and remove glove box (2) from instrument panel (1).

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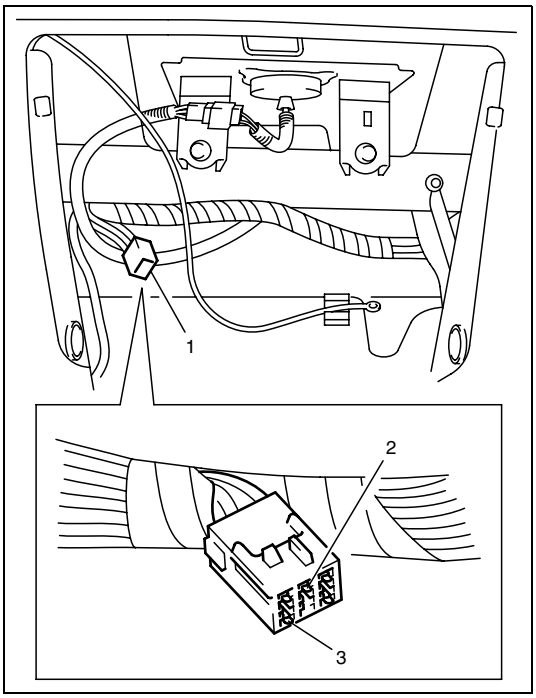
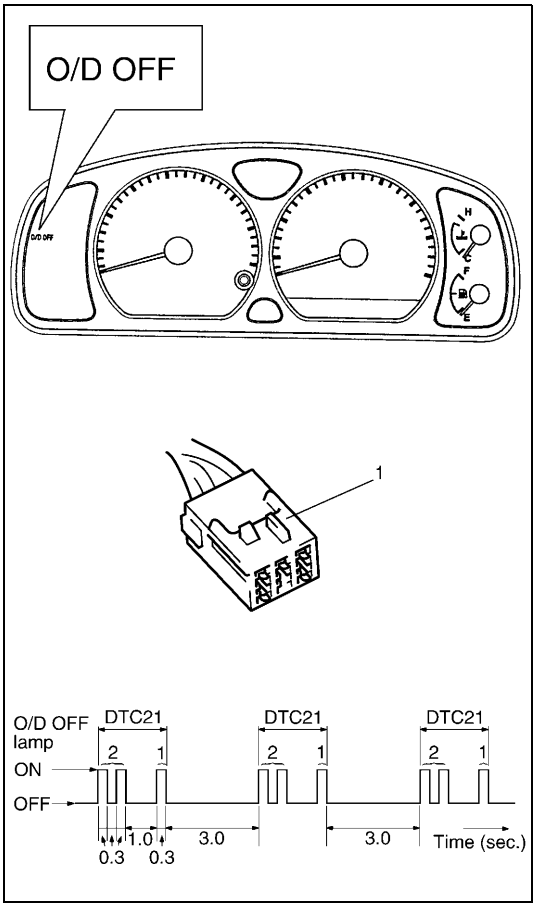


4) Using service wire, ground diagnosis switch terminal (2) of monitor connector No.2 (1).

3. Ground terminal



5) Turn ignition switch ON.
6) Read DTC from flashing pattern of O/D OFF lamp.
7) After completing the DTC check, turn ignition switch OFF and disconnect service wire from monitor connector No.2 (1).

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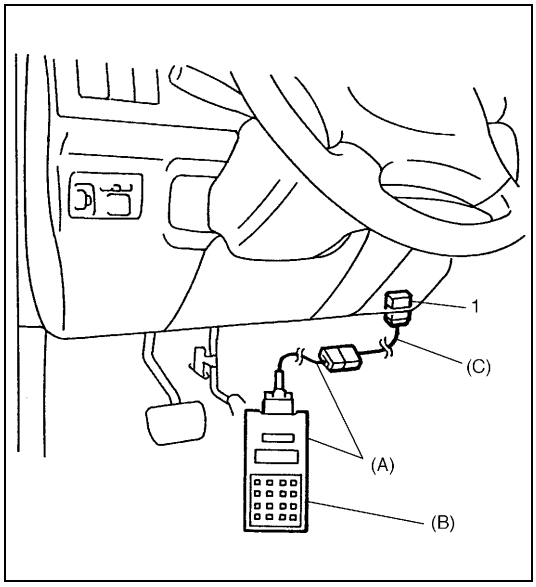
DTC CLEARANCE

[Clear DTC with SUZUKI scan tool]

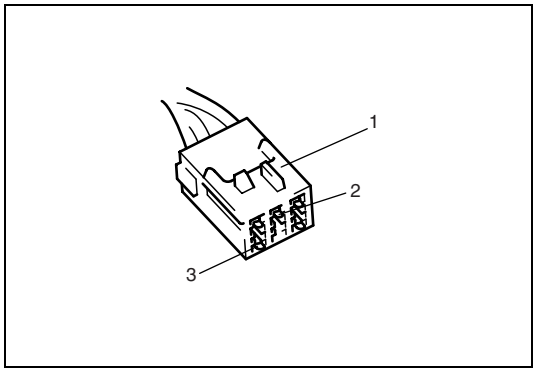


1) Turn ignition switch OFF.
2) After setting cartridge to scan tool, connect it to data link connector (DLC) (1) located on underside of instrument panel at driver's seat side.

Special tool
(A) : 09931-76011 (SUZUKI scan tool)
(B) : Mass storage cartridge
(C) : 09931-76030 (16/14 pin DLC cable)

3) Turn ignition switch ON.
4) Erase DTC according to instructions displayed on scan tool. Refer to SUZUKI scan tool operator's manual for further details.
5) After completing the clearance, turn ignition switch OFF and disconnect scan tool from data link connector (DLC) (1).

[Clear DTC without SUZUKI scan tool]



1) Turn ignition switch ON.
2) Using service wire, ground diagnosis switch terminal (2) of monitor connector No.2 (1) five times within 10 seconds.
3) Perform "DTC check" and confirm that only DTC12 (normal DTC) is displayed. If not, repeat step 1) and 2) and check again.

3. Ground terminal

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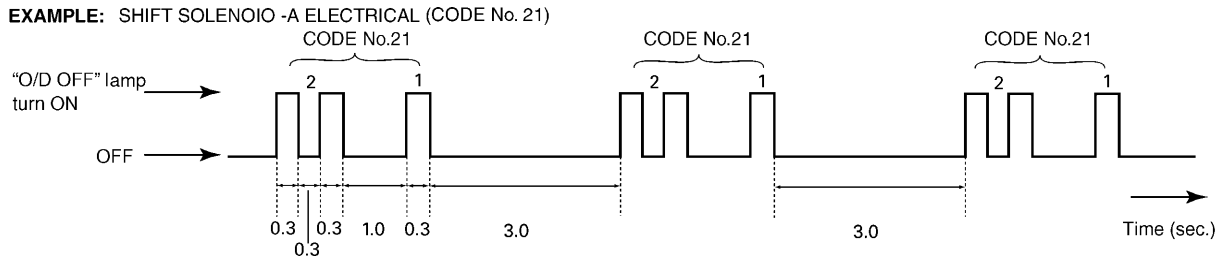
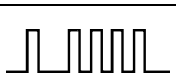
DTC TABLE



DTC NO.		"O/D OFF" Lamp Flashing Pattern of DTC (Not using scan tool)	DETECTING ITEMS	MIL	
Using scan tool	Not using scan tool			Vehicle equipped with immobilizer indicator lamp	Vehicle equipped without immobilizer indicator lamp
–	12		Normal	–	–
P0715	14		Input/Turbine speed sensor circuit malfunction	1 driving cycle	Not applicable
P0730	18		Incorrect gear ratio	2 driving cycles	Not applicable
P0753	21		Shift solenoid-A (No.1) electrical	1 driving cycle	Not applicable
	22				
P0758	23		Shift solenoid-B (No.2) electrical	1 driving cycle	Not applicable
	24				
P0763	43		Shift solenoid-C (No.3) electrical	1 driving cycle	Not applicable
P0768	45		Shift solenoid-D (No.4) electrical	1 driving cycle	Not applicable
P0773	48		Shift solenoid-E (No.5) electrical	1 driving cycle	Not applicable
P0743	25		Torque converter clutch (lock-up) system electrical	1 driving cycle	Not applicable
	26				

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DTC NO.		"O/D OFF" Lamp Flashing Pattern of DTC (Not using scan tool)	DETECTING ITEMS	MIL	
Using scan tool	Not using scan tool			Vehicle equipped with immobilizer indicator lamp	Vehicle equipped without immobilizer indicator lamp
P0741	29		Torque converter clutch (lock-up) solenoid performance or stuck off	2 driving cycles	Not applicable
P0720	31		Output shaft speed sensor circuit malfunction	1 driving cycle	Not applicable
P1700	32		Throttle position signal input malfunction	1 driving cycle	Not applicable
	33				
P0705	34		Transmission range sensor circuit malfunction	1 driving cycle	Not applicable
P0725	35		Engine speed input circuit malfunction	2 driving cycles	Not applicable
P0710	36		Transmission temperature sensor circuit malfunction	2 driving cycles	Not applicable
	38				
P1709	51		Engine coolant temperature signal circuit	1 driving cycle	Not applicable
P0702	52		Transmission control system electrical	1 driving cycle	Not applicable
P1702			Internal malfunction of TCM		

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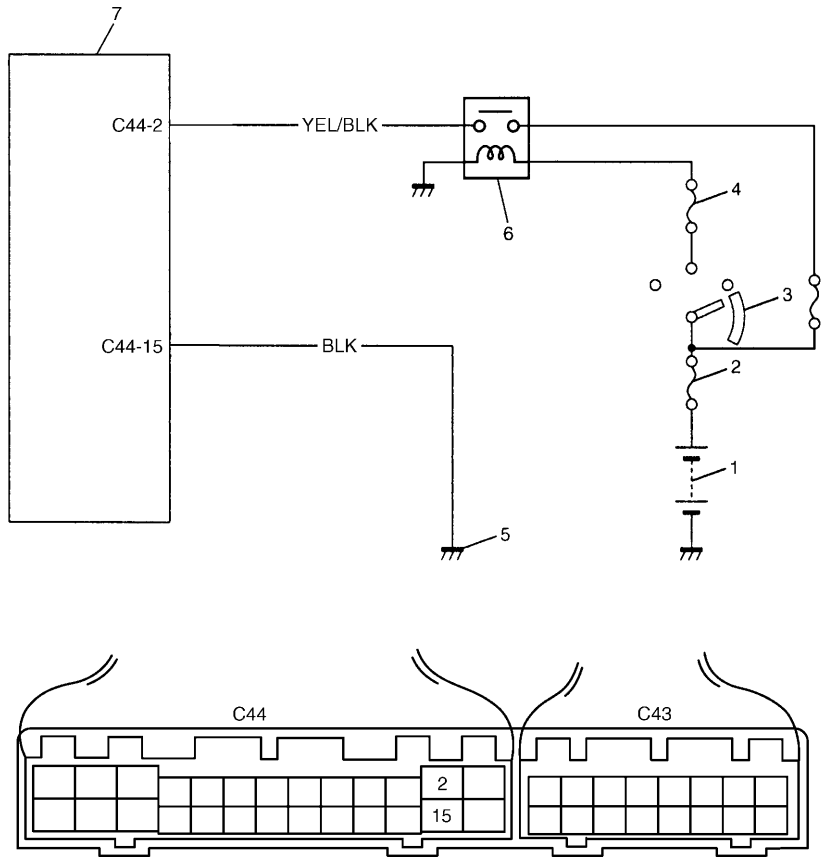
TCM POWER AND GROUND CIRCUIT CHECK



1. Battery	4. Circuit fuse (IG)	7. TCM
2. Main fuse	5. Ground	
3. Ignition switch	6. A/T relay	

DTC DETECTING CONDITION
• Automatic transmission doesn't shift to 1st gear at vehicle start in "D" range.

Step	Action	Yes	No
1	Check voltage between terminal "C44-2" of TCM coupler and body ground with ignition switch ON. Is it 10 – 14 V?	Go to Step 2.	YEL/BLK wire open or faulty A/T relay.
2	Check voltage between terminal "C44-15" of TCM coupler and body ground with ignition switch ON. Is it about 0 V?	Poor "C44-2" or "C44-15" connection. If all above are OK, replace known-good TCM and recheck.	"BLK" wire open.

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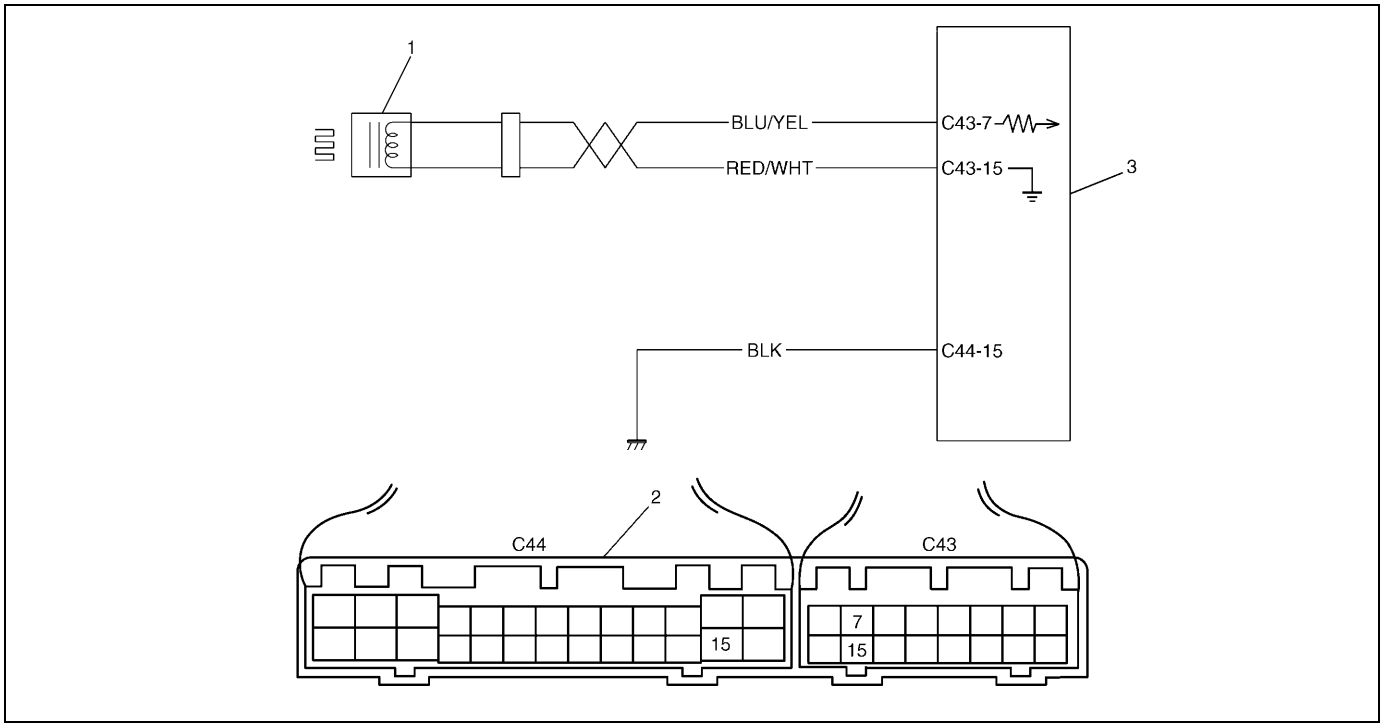
DTC P0715 (DTC NO.14) INPUT/TURBINE SPEED SENSOR CIRCUIT MALFUNCTION



1. Input shaft speed sensor	2. TCM coupler (viewed from harness side)	3. TCM

DTC DETECTING CONDITION
• Input shaft speed sensor signal voltage too high or too low.

Step	Action	Yes	No
1	Was “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE” performed?	Go to Step 2.	Go to “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE”.
2	1) Turn ignition switch OFF and disconnect output shaft speed sensor – input shaft speed sensor coupler. 2) Measure resistance between terminals of the disconnected sensor side coupler. Is it 160–200 Ω? (See figure.)	Go to Step 3.	Replace input shaft speed sensor.
3	1) Connect output shaft speed sensor - input shaft speed sensor coupler then disconnect TCM couplers. 2) Measure resistance between terminal “C43-7” and “C43-15” of disconnected harness side coupler. Is it 160–200 Ω?	Go to Step 4.	“BLU/YEL” or “RED/WHT” wire open or shorted each other.
4	1) Turn ignition switch OFF and connect input shaft speed sensor coupler then disconnect TCM couplers. 2) Measure resistance between terminal “C43-7” (of disconnected harness side coupler) and body ground then terminal “C43-15” (of disconnected harness side coupler) and body ground. Are they about 0 Ω? (See figure.)	Short in between “BLU/YEL” wire and ground or “RED/WHT” wire and ground.	Poor connection of terminal “C43-7” or “C43-15” of TCM. If all the above are in good condition, substitute a known-good TCM and recheck.

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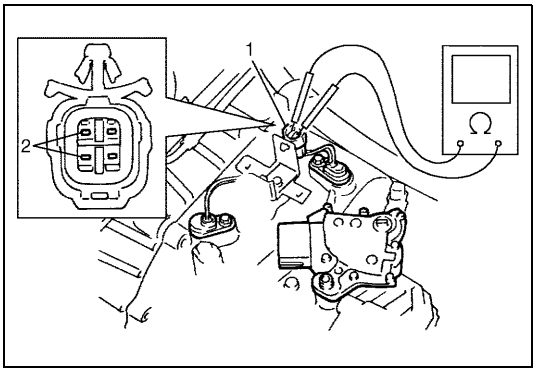
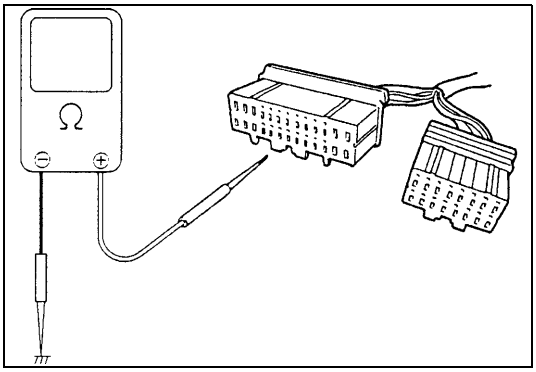
Figure for Step 2



1.	Output shaft speed sensor - Input shaft speed sensor coupler
2.	Input shaft speed sensor terminal

Figure for Step 4



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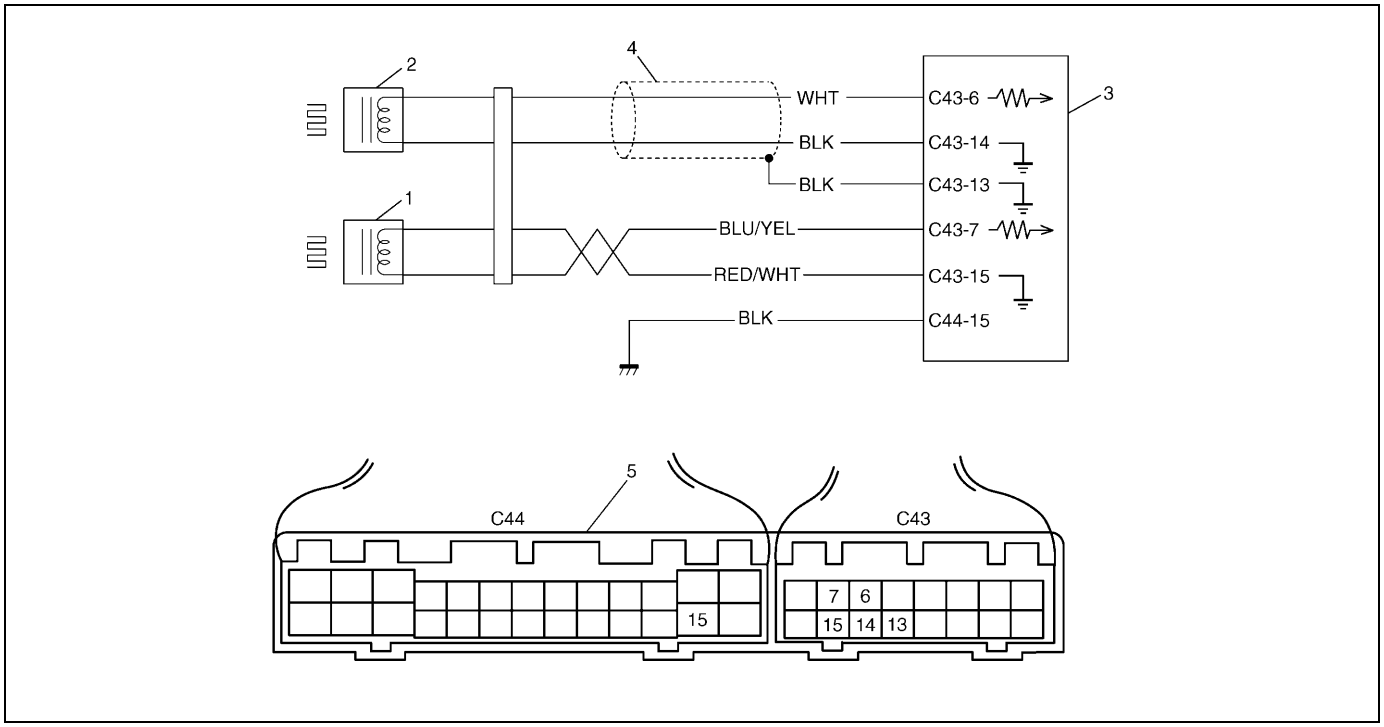
DTC P0730 (DTC NO. 18) INCORRECT GEAR RATIO



1. Input shaft speed sensor	4. Shield wire
2. Output shaft speed sensor	5. TCM coupler (viewed from harness side)
3. TCM	

DTC DETECTING CONDITION
• Difference in detected revolution between input shaft speed sensor and output shaft speed sensor too wide.

Step	Action	Yes	No
1	Check if DTC P0730 (DTC No.18) displayed with DTC P0715 (DTC No.14) or DTC P0720 (DTC No.31). Is DTC P0730 (DTC No.18) displayed with DTC P0715 (DTC No.14) or DTC P0720 (DTC No.31)? (See figure.)	Inspect according to DTC P0715 (DTC No.14) or DTC P0720 (DTC No.31) flow table first.	Go to Step 2.
2	1) Turn ignition switch OFF and disconnect TCM couplers. 2) Measure resistance between terminal “C43-13” of the disconnected harness side coupler and body ground. Is it about 0 Ω? (See figure.)	Short in between shield portion or “BLK” wire and ground.	Go to Step 3.

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Step	Action	Yes	No
3	Check input shaft speed sensor and output shaft speed sensor referring to each item in this section. Are they OK? (See figure.)	• Broken wire in shield portion or broken “BLK” wire, or shorted to power source circuit. • Malfunction of A/T itself (over revolving of C0 clutch drum by departing of C0 clutch drum snap ring, clutch slipping, etc.) If all the above are in good condition, substitute a known-good TCM and recheck.	Inspect and replace referring to each item in this section.

Figure for Step 1

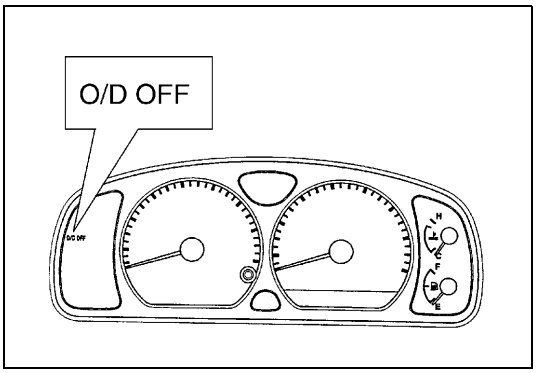


Figure for Step 2

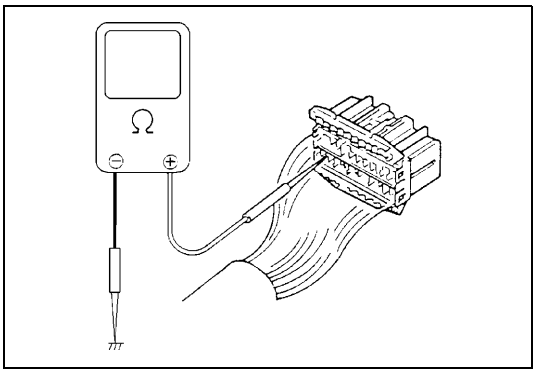
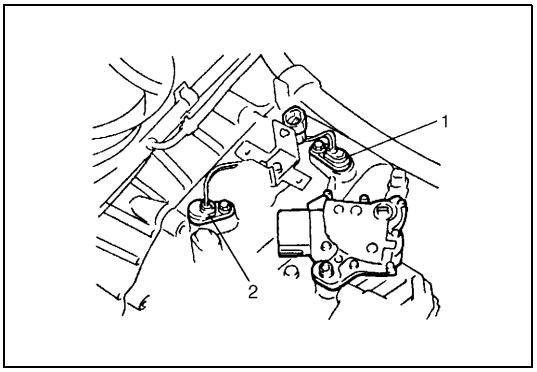


Figure for Step 3



1.	Output shaft speed sensor
2.	Input shaft speed sensor

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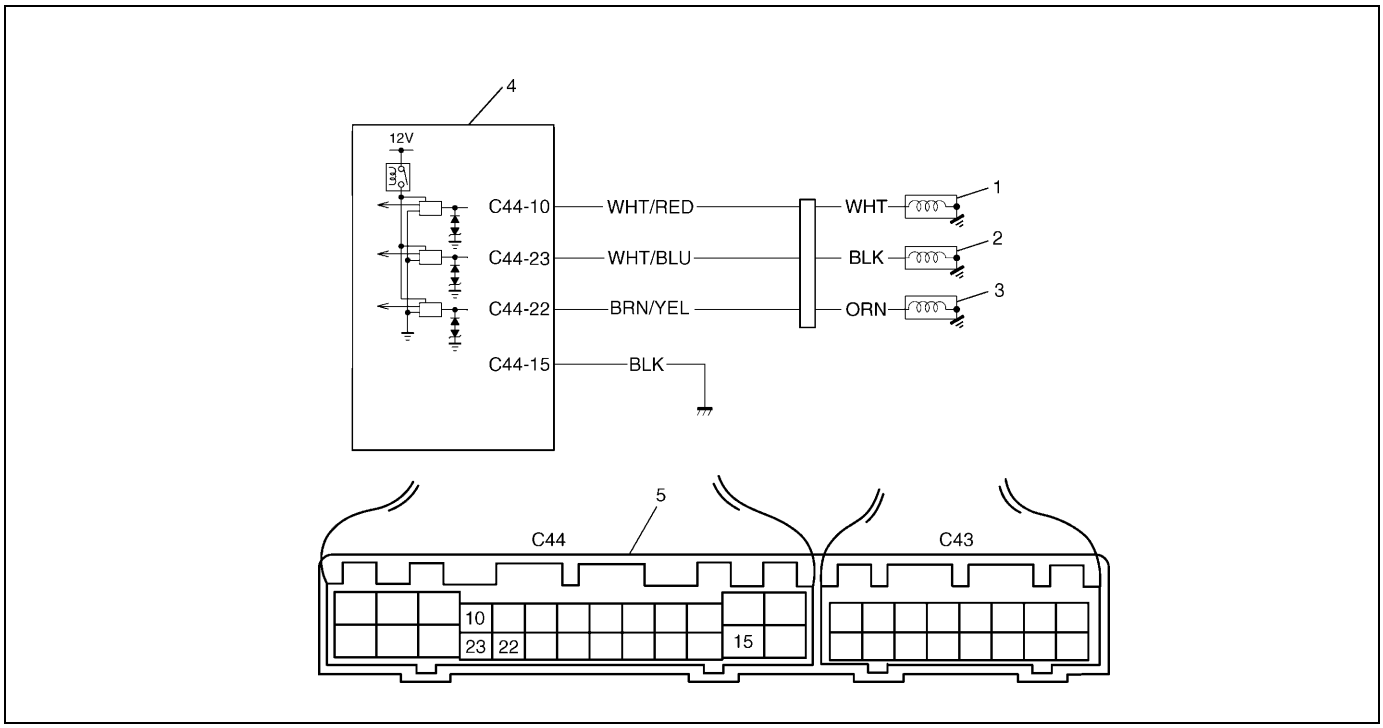
DTC P0753 (DTC NO.21/22) SHIFT SOLENOID-A (NO.1) ELECTRICAL
DTC P0758 (DTC NO.23/24) SHIFT SOLENOID-B (NO.2) ELECTRICAL
DTC P0743 (DTC NO.25/26) TCC (LOCK-UP CLUTCH) SYSTEM ELECTRICAL



1. Shift solenoid-A (No.1)	4. TCM
2. Shift solenoid-B (No.2)	5. TCM coupler (viewed from harness side)
3. TCC (lock-up) solenoid	

DTC DETECTING CONDITION
• Solenoid output voltage too high although TCM orders solenoid to turn OFF. • Solenoid output voltage too low although TCM orders solenoid to turn ON.

Step	Action	Yes	No
1	1) Turn ignition switch OFF and disconnect solenoid coupler. 2) Measure the resistance between each solenoid terminal of the solenoid side coupler and transmission ground. Is it 11 – 15 Ω? (See figure.)	Go to Step 2.	• Solenoid lead wire open or shorted to ground. • Malfunction of solenoid.
2	Is DTC No.22, 24 or 26?	Go to Step 4.	Go to Step 3.
3	Is DTC No.21, 23 or 25?	Go to Step 6.	Go to Step 5. (When DTC is P0753, P0758 or P0743.)
4	1) Disconnect TCM couplers. 2) Measure the resistance between terminal “C44-10”, “C44-23” or “C44-22” of the disconnected harness side TCM coupler and body ground. Is it about 0 Ω? (See figure.)	“WHT/RED”, “WHT/BLU” or “BRN/YEL” wire shorted to ground.	Substitute a known-good TCM and recheck.

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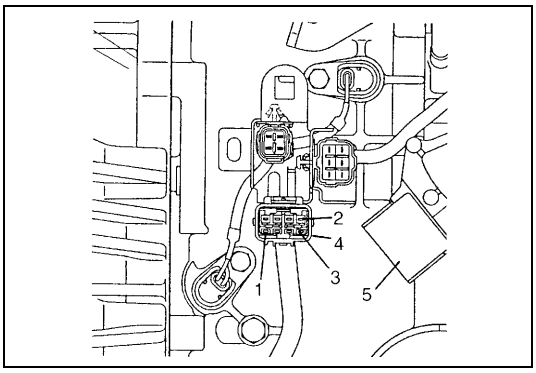
Step	Action	Yes	No
5	1) Disconnect TCM couplers. 2) Measure the resistance between terminal "C44-10", "C44-23" or "C44-22" of the disconnected harness side TCM coupler and body ground. Is it about 0 Ω? (See figure.)	"WHT/RED", "WHT/BLU", or "BRN/YEL" wire shorted to ground.	Go to Step 6.
6	1) Connect solenoid coupler then disconnect TCM couplers. 2) Measure the resistance between each solenoid terminal of the disconnected harness side TCM coupler and body ground. Is it 10.5 – 15.5 Ω?	Go to Step 7.	"WHT/RED", "WHT/BLU" or "BRN/YEL" wire open or poor connection of shift solenoid coupler.
7	Turn ignition switch ON then measure voltage between terminal "C44-10", "C44-23" or "C44-22" of the disconnected harness side TCM coupler and body ground. Is it about 0 V?	Poor connection at terminal "C44-10", "C44-23" or "C44-22" of TCM. If all the above are in good condition, substitute a known-good TCM and recheck.	"WHT/RED", "WHT/BLU" or "BRN/YEL" wire or shift solenoid lead wire shorted to power source circuit.

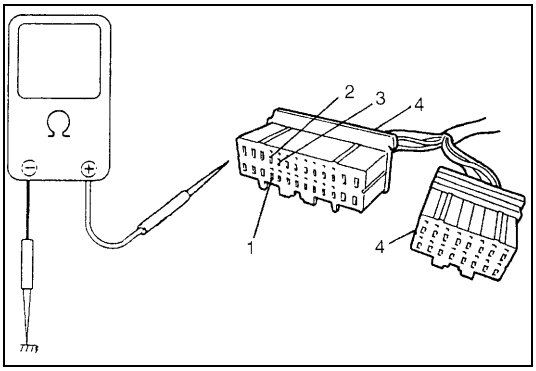
Solenoid	TCM Terminal Number	Lead Wire Color (between TCM and solenoid coupler)
Shift solenoid -A (No.1)	C44-10	WHT/RED
Shift solenoid -B (No.2)	C44-23	WHT/BLU
TCC solenoid (Lock-up solenoid)	C44-22	BRN/YEL

Figure for Step 1



1. Shift solenoid -A (No.1) terminal
2. Shift solenoid -B (No.2) terminal
3. TCC (Lock-up) solenoid terminal
4. Solenoid coupler
5. Transmission range sensor (Shift switch)

Figure for Step 4, 5, 6, 7



1. "C44-10" terminal
2. "C44-23" terminal
3. "C44-22" terminal
4. TCM couples

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DTC P0741 (DTC NO.29) TCC (LOCK-UP) SOLENOID PERFORMANCE OR STUCK OFF

Step	Action	Yes	No
1	Was “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE” performed?	Go to Step 2.	Go to “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE”.
2	Check TCC (lock-up) solenoid referring to “SHIFT SOLENOID VALVES” in this section. Is it in good condition?	Go to Step 3.	Replace TCC (lock-up) solenoid.
3	Check valve body for fluid passage clog, or lock-up control valve, secondary regulator valve or signal valve stuck, referring to “TRANSMISSION UNIT REPAIR OVERHAUL” in this section. Are they in good condition?	Go to Step 4.	Faulty valve body.
4	Substitute a known-good torque converter and recheck. Is it OK?	Torque converter malfunction.	Overhaul and repair automatic transmission.

DTC DETECTING CONDITION
• Difference between turbine rev. and engine rev. too close even though TCM ordered to turn OFF lock-up. • Difference between turbine rev. and engine rev. too wide even though TCM ordered to turn ON lock-up.

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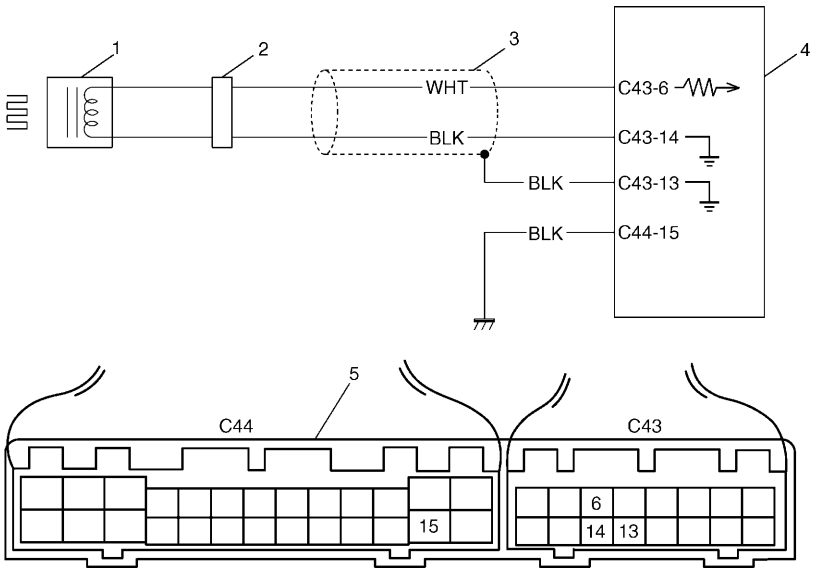
DTC P0720 (DTC NO. 31) OUTPUT SHAFT SPEED SENSOR CIRCUIT MALFUNCTION



1. Output shaft speed sensor (A/T VSS)	4. TCM
2. Coupler	5. TCM coupler (viewed from harness side)
3. Shield wire	

DTC DETECTING CONDITION
• Output shaft speed sensor signal voltage too high or too low.

Step	Action	Yes	No
1	1) Turn ignition switch OFF and disconnect output shaft speed sensor – input shaft speed sensor coupler. (See figure.) 2) Measure the resistance between terminals of disconnected sensor side coupler. Is it 160 – 200 Ω? (See figure.)	Go to Step 2.	Replace output shaft speed sensor.
2	1) Connect output shaft speed sensor coupler then disconnect TCM couplers. 2) Measure resistance between terminal “C43-6” and “C43-14” of disconnected harness side coupler. Is it 160 – 200 Ω? (See figure.)	Go to Step 3.	“WHT” or “BLK” wire open or shorted each other.

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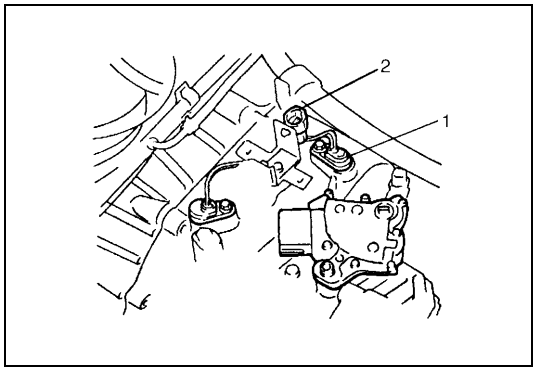
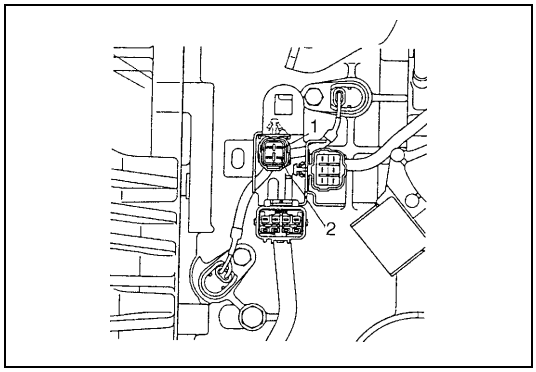
Step	Action	Yes	No
3	1) Turn ignition switch OFF and disconnect output shaft speed sensor – input shaft speed sensor coupler. (See figure.) 2) Measure resistance between terminal “3” (of disconnected sensor side coupler) and body ground then terminal “4” (of disconnected sensor side coupler) and body ground. Is it about 0 Ω? (See figure.)	Replace output shaft speed sensor.	Go to Step 4.
4	1) Turn ignition switch OFF and connect output shaft speed sensor coupler then disconnect TCM couplers. 2) Measure resistance between terminal “C43-6” (of disconnected harness side coupler) and body ground then terminal “C43-14” (of disconnected harness side coupler) and body ground. Is it about 0 Ω? (See figure.)	“WHT” or “BLK” wire shorted to ground.	Go to Step 5.
5	Measure resistance between terminal “C43-6” and “C43-13” (of disconnected harness side coupler) then terminal “C43-14” and “C43-13” (of disconnected harness side coupler). Is it about 0 Ω? (See figure.)	“WHT” wire or “BLK” wire shorted to shield portion.	Poor connection of terminal “C43-6” or “C43-14” of the TCM. If all the above are in good condition, substitute a known-good TCM and recheck.

Figure for Step 1, 2



1.	Output shaft speed sensor
2.	Input shaft speed sensor coupler

Figure for Step 2, 3



1.	Terminal “3”
2.	Terminal “4”

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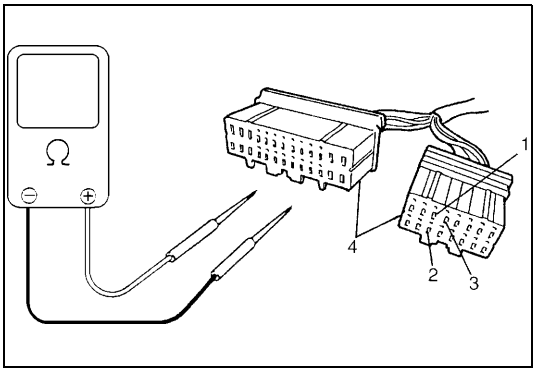
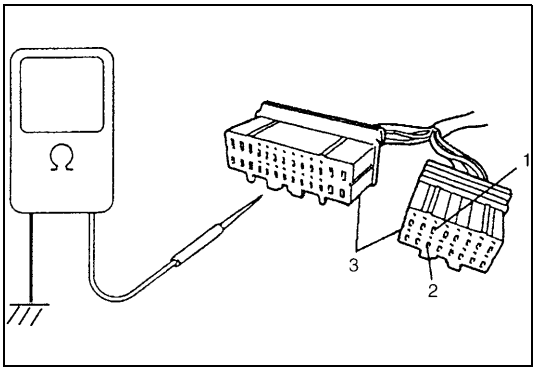
Figure for Step 2, 5



1.	“C43-14” terminal
2.	“C43-6” terminal
3.	“C43-13” terminal
4.	TCM coupler

Figure for Step 4



1.	“C43-14” terminal
2.	“C43-6” terminal
3.	TCM coupler

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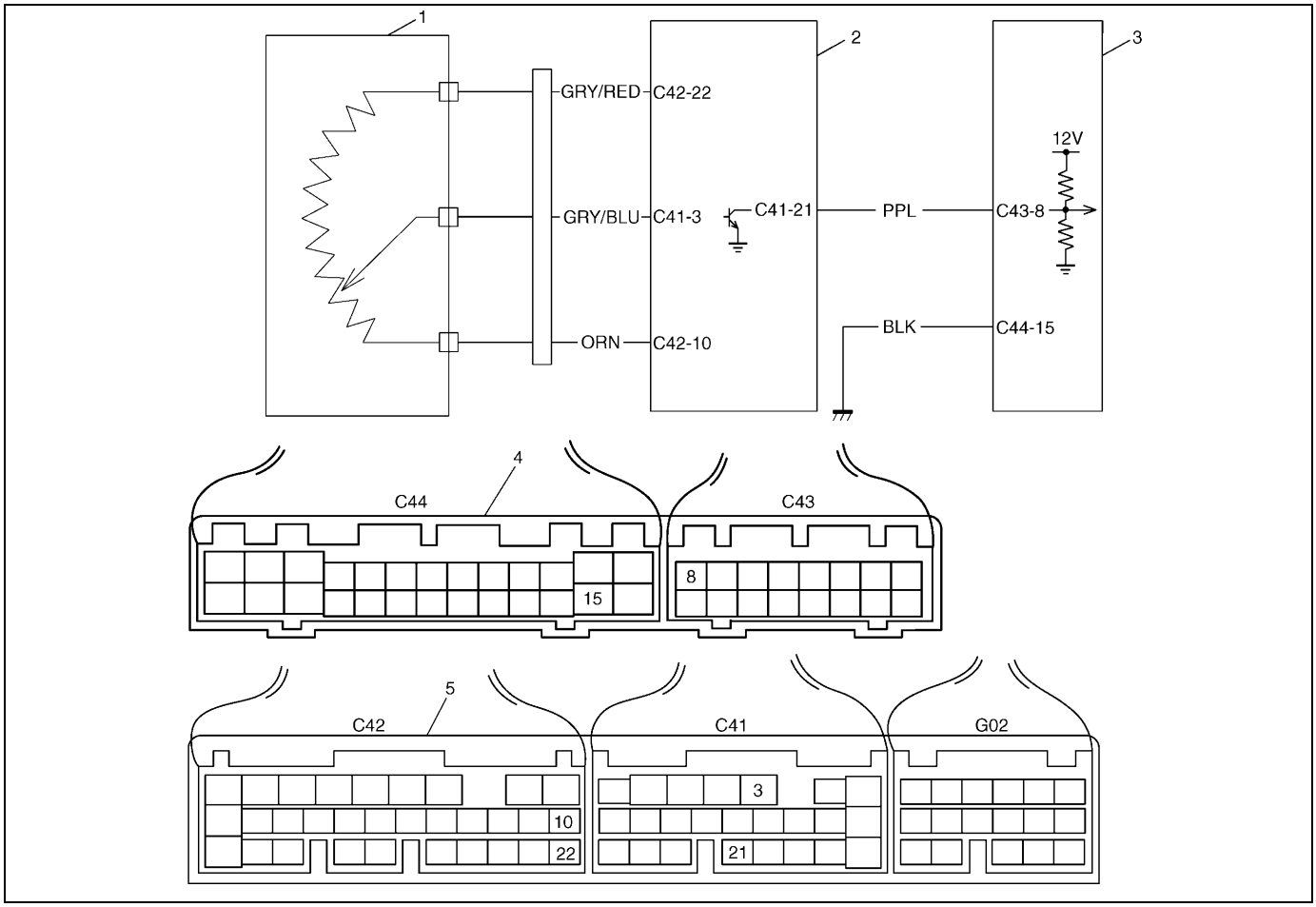
DTC P1700 (DTC NO.32/33) THROTTLE POSITION SIGNAL INPUT MALFUNCTION



1. Throttle position (TP) sensor	4. TCM coupler (viewed from harness side)
2. ECM	5. ECM coupler (viewed from harness side)
3. TCM	

DTC DETECTING CONDITION
• NO or abnormal throttle opening signal inputted.

Step	Action	Yes	No
1	Check DTC of “ENGINE DIAGNOSIS” referring to Section 6. Is there DTC related to throttle position sensor detected?	Inspect and repair referring to DTC flow table of “ENGINE DIAGNOSIS” in Section 6.	Go to Step 2.
2	Is DTC No.33?	Go to Step 4.	Go to Step 3.
3	Is DTC No.32?	Go to Step 5.	Go to Step 5. (When DTC is P1700.)
4	1) Turn ignition switch OFF and disconnect ECM couplers. 2) Turn ignition switch ON and check voltage between terminal “C41-21” of disconnected harness side ECM coupler and body ground. Is it 10 – 14 V?	Poor connection of terminal “C41-21” of ECM coupler. If connection is OK, substitute a known-good ECM and recheck.	“PPL” wire open or poor connection of terminal “C43-8” of TCM coupler. If wire and connection are OK, substitute a known-good TCM and recheck.

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Step	Action	Yes	No
5	1) Turn ignition switch OFF and disconnect ECM couplers. 2) Turn ignition switch ON and check voltage between terminal “C41-21” of disconnected harness side ECM coupler and body ground. Is it 10 – 14 V?	Go to Step 7.	Substitute a known-good TCM and recheck.
6	1) Check for proper connection of terminal “C41-21” of ECM coupler. 2) If OK, turn ignition switch OFF and disconnect ECM couplers. 3) Turn ignition switch ON and check voltage between terminal “C41-21” of disconnected harness side ECM coupler and body ground. Is it 10 – 14 V?	Go to Step 7.	“PPL” wire open or poor connection of terminal “C43-8” of TCM coupler. If wire and connection are OK, substitute a known-good TCM and recheck.
7	1) Turn ignition switch OFF and disconnect TCM couplers. 2) Check resistance between terminal “C43-8” of disconnected harness side TCM coupler and body ground. Is it infinity?	Intermittent trouble or faulty ECM. Check for intermittent referring to “INTERMITTENT AND POOR CONNECTION” in Section 0A. If no trouble found, substitute a known-good ECM and recheck.	“PPL” wire shorted to ground.

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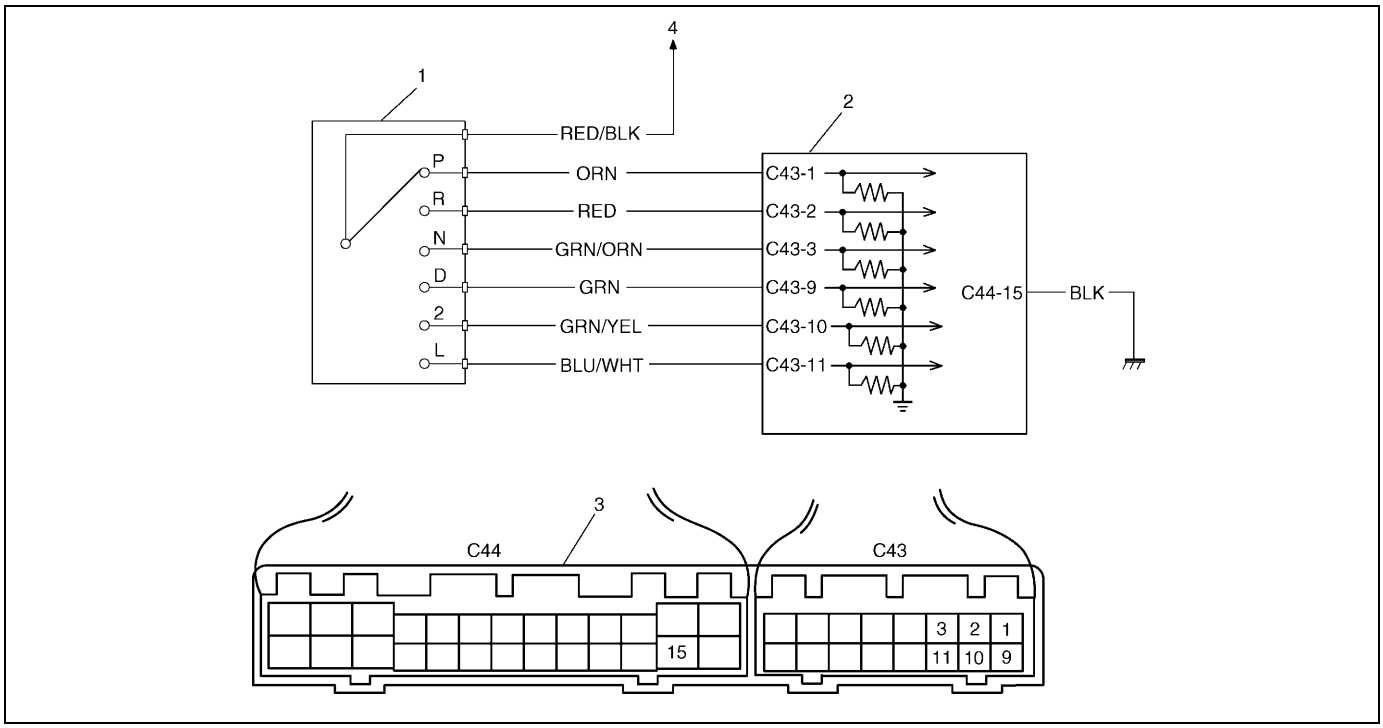
DTC P0705 (DTC NO.34) TRANSMISSION RANGE SENSOR (SWITCH) CIRCUIT MALFUNCTION



1. Transmission range sensor (shift switch)	3. TCM coupler (viewed from harness side)
2. TCM	4. Power source

DTC DETECTING CONDITION
• No shift switch signal inputted or two or more shift switch signals inputted at the same time.

Step	Action	Yes	No
1	1) Turn ignition switch OFF, disconnect TCM coupler. 2) Turn ignition switch ON, check voltage between terminal “C43-1” and “C44-15” of disconnected harness side TCM coupler. Is it 10 – 14 V at “P” range and 0 V at the other range?	Go to Step 2.	Go to Step 7.
2	While ignition switch ON, check voltage between terminal “C43-2” and “C44-15” of disconnected harness side TCM coupler. Is it 10 – 14 V at “R” range and 0 V at the other range?	Go to Step 3.	Go to Step 7.
3	While ignition switch ON, check voltage between terminal “C43-3” and “C44-15” of disconnected harness side TCM coupler. Is it 10 – 14 V at “N” range and 0 V at the other range?	Go to Step 4.	Go to Step 7.
4	While ignition switch ON, check voltage between terminal “C43-9” and “C44-15” of disconnected harness side TCM coupler. Is it 10 – 14 V at “D” range and 0 V at the other range?	Go to Step 5.	Go to Step 7.

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Step	Action	Yes	No
5	While ignition switch ON, check voltage between terminal “C43-10” and “C44-15” of disconnected harness side TCM coupler. Is it 10 – 14 V at “2” range and 0 V at the other range?	Go to Step 6.	Go to Step 7.
6	While ignition switch ON, check voltage between terminal “C43-11” and “C44-15” of disconnected harness side TCM coupler. Is it 10 – 14 V at “L” range and 0 V at the other range?	Intermittent trouble or faulty TCM. Check for intermittent trouble referring to “INTERMITTENT AND POOR CONNECTION” in Section 0B.	Go to Step 7.
7	Check transmission range sensor referring in this section. Is it OK?	Transmission range sensor wire shorted. If wire harnesses are OK, substitute a known-good TCM and recheck.	Replace transmission range sensor.

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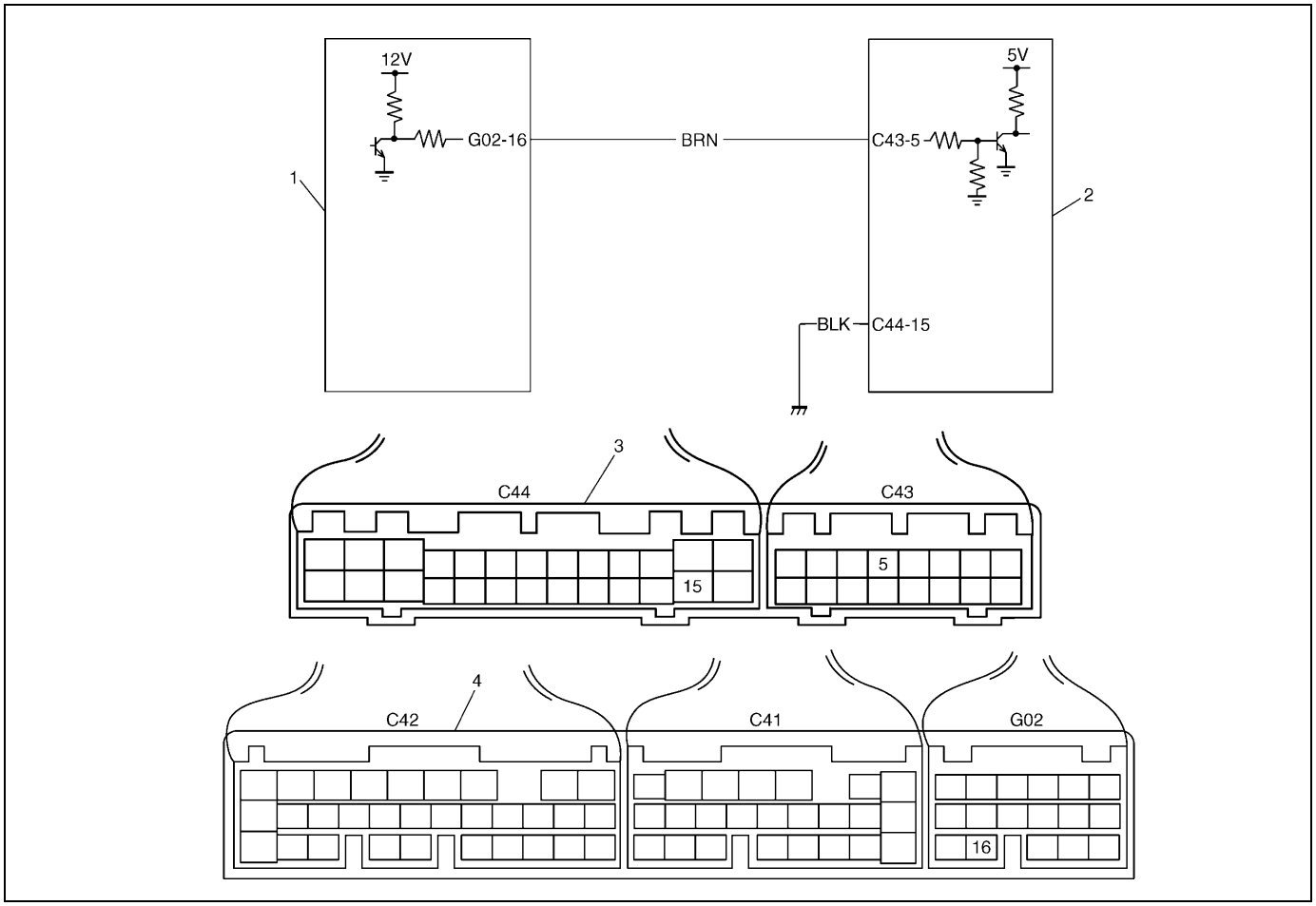
DTC P0725 (DTC NO.35) ENGINE SPEED INPUT CIRCUIT MALFUNCTION



1. ECM	3. TCM coupler (viewed from harness side)
2. TCM	4. ECM coupler (viewed from harness side)

DTC DETECTING CONDITION
• Inputted engine rev. signal too low or too high.

Step	Action	Yes	No
1	Check DTC of “ENGINE DIAGNOSIS” referring to Section 6. Is there DTC related to engine speed sensor?	Inspect and repair referring to DTC flow table of “ENGINE DIAGNOSIS” in Section 6.	Go to Step 2.
2	1) Turn ignition switch OFF and disconnect ECM or TCM couplers. 2) Measure resistance between terminal “G02-16” and “C43-5” of disconnected harness side coupler. Is it about 0 Ω?	Go to Step 3.	“BRN” wire open.
3	Measure resistance between terminal “C43-5” of disconnected harness side coupler and body ground. Is it infinity?	Go to Step 4.	“BRN” wire shorted to ground

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Step	Action	Yes	No
4	1) Turn ignition switch OFF and connect ECM couplers. 2) Turn ignition switch ON and measure voltage between terminal “C43-5” of disconnected harness side TCM coupler and body ground. Is it 10 – 14 V?	Intermittent trouble or faulty ECM or TCM. Check for intermittent referring to “INTERMITTENT AND POOR CONNECTION” in Section 0A. If no trouble found, substitute a known-good ECM or TCM and recheck.	“BRN” wire is shorted to power circuit or faulty ECM. If “BRN” wire is OK, substitute a known-good ECM and recheck.

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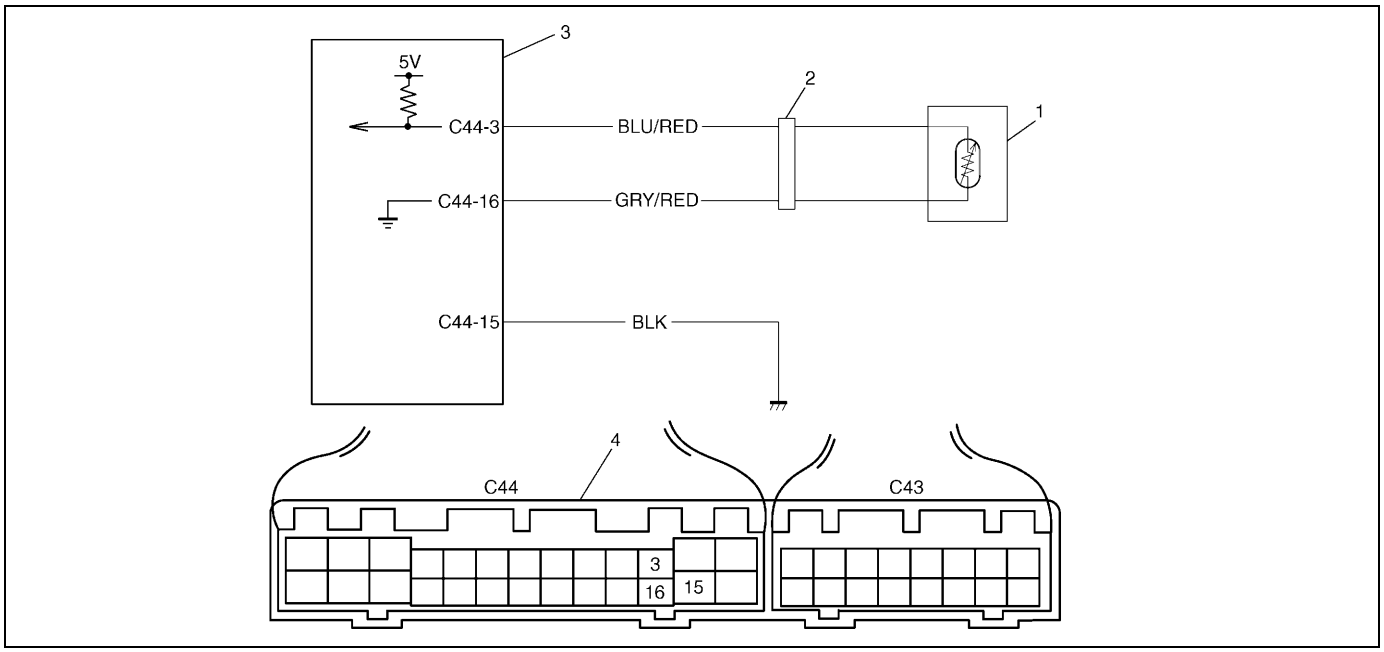
DTC P0710 (DTC No.36/38) TRANSMISSION TEMPERATURE SENSOR CIRCUIT MALFUNCTION



1. Transmission temperature sensor	3. TCM
2. Coupler	4. TCM coupler (viewed from harness side)

DTC DETECTING CONDITION
• A/T fluid temperature signal input voltage too low. • A/T fluid temperature signal input voltage does not go down although standard value of engine rev. signal input.

Step	Action	Yes	No
1	1) Turn ignition switch OFF and disconnect sensor wire harness coupler. 2) Measure resistance between “BLU/RED” wire and “GRY/RED” wire terminal of sensor side coupler. Is it infinity or 0 Ω?	Faulty transmission temperature sensor. Replace transmission temperature sensor.	Go to Step 2.
2	Is DTC No.36?	Go to Step 4.	Go to Step 3.
3	Is DTC No.38?	Go to Step 5.	Go to Step 6. (When DTC is P0710.)
4	1) Turn ignition switch OFF and connect sensor wire harness coupler. 2) Disconnect TCM couplers. 3) Measure the resistance between terminal “C44-3” and “C44-16” of disconnected harness side coupler. Is it about 0 Ω?	“BLU/RED” and “GRY/RED” wire shorted each other.	Substitute a known-good TCM and recheck.

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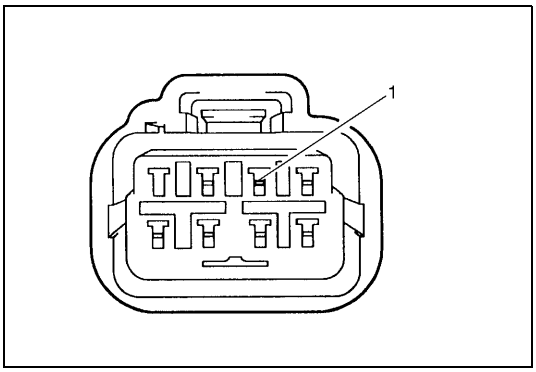
Step	Action	Yes	No
5	1) Turn ignition switch OFF and connect sensor wire harness coupler. 2) Disconnect TCM couplers. 3) Measure the resistance between terminal "C44-3" and "C44-16" of disconnected harness side coupler. Is it infinity?	"BLU/RED" or "GRY/RED" wire open or poor connection of solenoid wire harness coupler.	Go to Step 7.
6	1) Turn ignition switch OFF and connect sensor wire harness coupler. 2) Disconnect TCM couplers. 3) Measure the resistance between terminal "C44-3" and "C44-16" of disconnected harness side coupler. Is it about 0 Ω or infinity?	"BLU/REDl" or "GRY/RED" wire open, shorted each other or poor connection of solenoid wire harness coupler.	Go to Step 7.
7	1) Turn ignition switch OFF and connect TCM couplers. 2) Disconnect solenoid wire harness coupler. 3) Turn ignition switch ON then measure voltage between "BLU/RED" wire terminal of disconnected harness side coupler and engine ground. (See figure.) Is it 4 – 6 V?	Intermittent trouble or faulty TCM. Check for intermittent referring to "INTERMITTENT AND POOR CONNECTION" in Section 0A. If no trouble found, substitute a known-good TCM and recheck.	"BLU/RED" wire shorted to power circuit or poor connection of terminal "C44-3". If wire and connection are OK, substitute a known-good TCM.

Figure for Step 7



1. BLU/RED wire terminal

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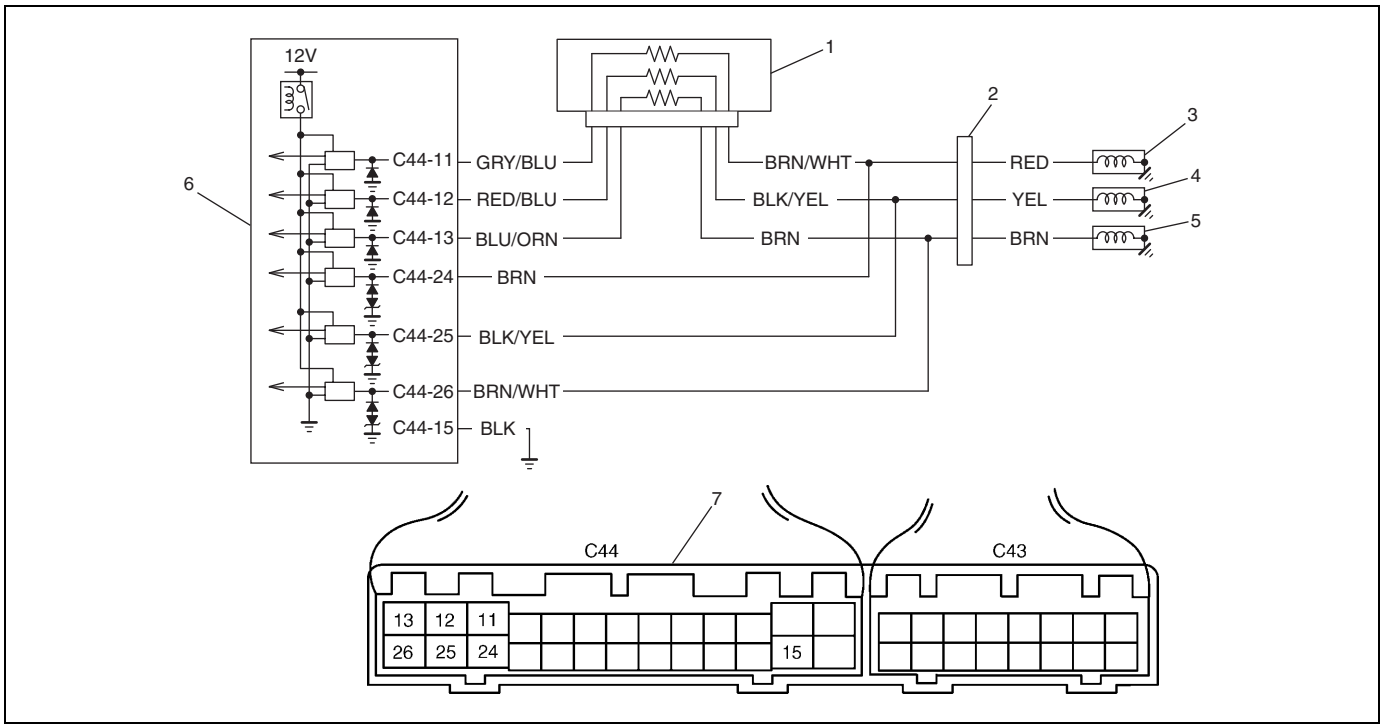
DTC P0763 (DTC NO.43) SHIFT SOLENOID-C (NO.3) ELECTRICAL
DTC P0768 (DTC NO.45) SHIFT SOLENOID-B (NO.4) ELECTRICAL
DTC P0773 (DTC NO.48) SHIFT SOLENOID-E (NO.5) ELECTRICAL



1. Dropping resistor	4. Shift solenoid-D (No.4)	7. TCM coupler (viewed from harness side)
2. solenoid coupler	5. Shift solenoid-E (No.5)	
3. Shift solenoid-C (No.3)	6. TCM	

DTC DETECTING CONDITION
• Solenoid output voltage too high or too low differently from TCM order.

Step	Action	Yes	No
1	1) Turn ignition switch OFF and disconnect solenoid coupler. 2) Measure resistance between terminal of solenoid coupler and transmission ground. (See figure.) Is it 2.5 – 3.5 Ω?	Go to Step 2.	• Solenoid lead wire open or shorted to ground. • Malfunction of solenoid valve.
2	1) Disconnect TCM couplers. 2) Measure resistance between terminal of disconnected body side solenoid coupler and terminal “C44-11”, “C44-12” or “C44-13” of disconnected harness side TCM coupler. (See chart.) Is it 6.5 – 8.5 Ω?	Go to Step 3.	Inspect dropping resister referring to “DROPPING RESISTOR” in this section. If OK, circuit between TCM and dropping resister or dropping resister and solenoid coupler open.
3	Check continuity between terminal “C44-24”, “C44-25” or “C44-26” of disconnected TCM coupler and terminal of disconnected body side solenoid coupler. (See chart.) Is there continuity?	Go to Step 4.	Circuit between TCM and solenoid coupler open.

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Step	Action	Yes	No
4	Check continuity between terminal of disconnected body side solenoid coupler and transmission ground with TCM, dropping resister and solenoid couplers disconnected. Is there continuity?	Circuit between TCM and transmission shorted to ground.	Go to Step 5.
5	Check continuity between terminal of disconnected body side dropping resistor coupler and transmission ground. (See chart.) Is there continuity?	Circuit between TCM and dropping resister is shorted to ground.	Intermittent trouble or faulty TCM. Check for intermittent referring to “INTERMITTENT AND POOR CONNECTION” in Section 0A. If no trouble found, substitute a known-good TCM and recheck.

Chart for Step 2

Solenoid	TCM terminal No.	Solenoid coupler lead wire color (body side)
C (No.3)	C44-11	BRN
D (No.4)	C44-12	BLK/YEL
E (No.5)	C44-13	BRN/WHT

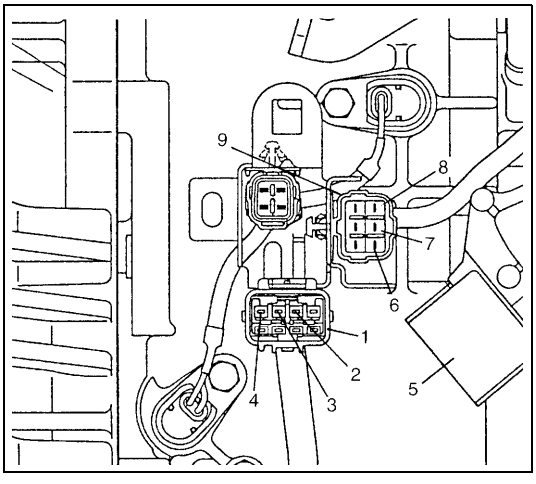
Chart for Step 3

Solenoid	TCM terminal No.	Solenoid coupler lead wire color (body side)
C (No.3)	C44-24	BRN
D (No.4)	C44-25	BLK/YEL
E (No.5)	C44-26	BRN/WHT

Chart for Step 5

Solenoid	TCM terminal No.	Dropping resistor lead wire color (body side)
C (No.3)	C44-11	GRY/BLU
D (No.4)	C44-12	RED/BLU
E (No.5)	C44-13	BLU/ORN

Figure for Step 1 and 5



1. Solenoid coupler
2. Terminal for shift solenoid-C (No.3)
3. Terminal for shift solenoid-D (No.4)
4. Terminal for shift solenoid-E (No.5)
5. Transmission range sensor (Shift switch)
6. Dropping resistor terminal for shift solenoid-C (No.3)
7. Dropping resistor terminal for shift solenoid-D (No.4)
8. Dropping resistor terminal for shift solenoid-E (No.5)
9. Dropping resistor coupler

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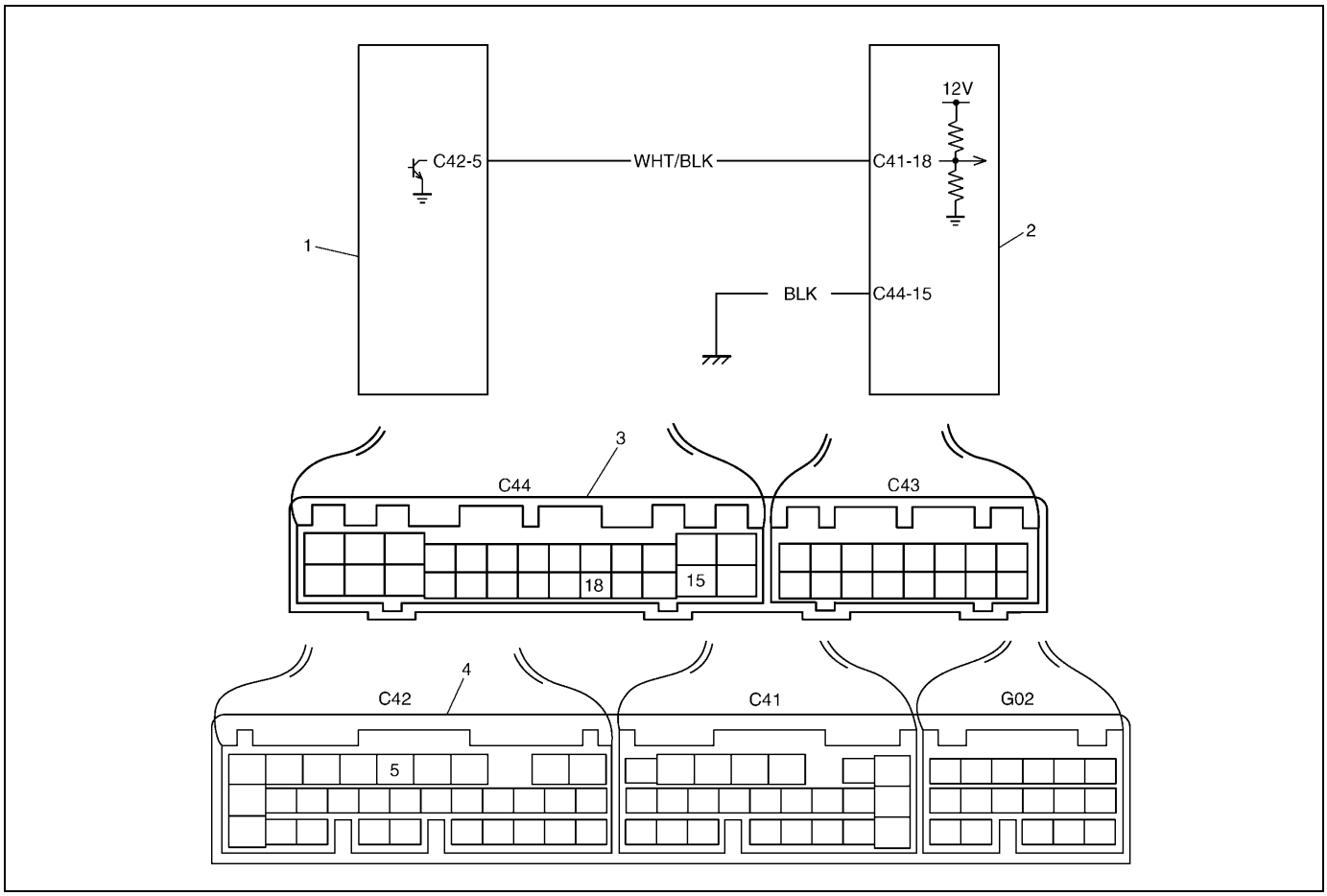
DTC P1709 (DTC NO.51) ENGINE COOLANT TEMPERATURE/BAROMETRIC PRESSURE SIGNAL CIRCUIT



1. ECM	3. TCM coupler (viewed from harness side)
2. TCM	4. ECM coupler (viewed from harness side)

DTC DETECTING CONDITION
• Engine coolant temperature/barometric pressure signal voltage too low although A/T fluid temperature is normal operating temperature and engine rev. is standard.

Step	Action	Yes	No
1	Check DTC referring to “ENGINE DIAGNOSIS” in Section 6. Is any DTC detected?	Inspect and repair referring to DTC flow table in Section 6.	Go to Step 2.
2	1) Turn ignition switch OFF and disconnect TCM and ECM couplers. 2) Measure resistance between terminal “C44-18” of disconnected harness side TCM coupler and body ground. Is it infinity?	Go to Step 3.	“WHT/BLK” wire shorted to ground.
3	1) Turn ignition switch OFF and connect TCM couplers. 2) Turn ignition switch ON and check voltage between terminal “C44-18” and body ground. Is it 0V?	Substitute a known-good TCM and recheck.	Substitute a know-good ECM and recheck.

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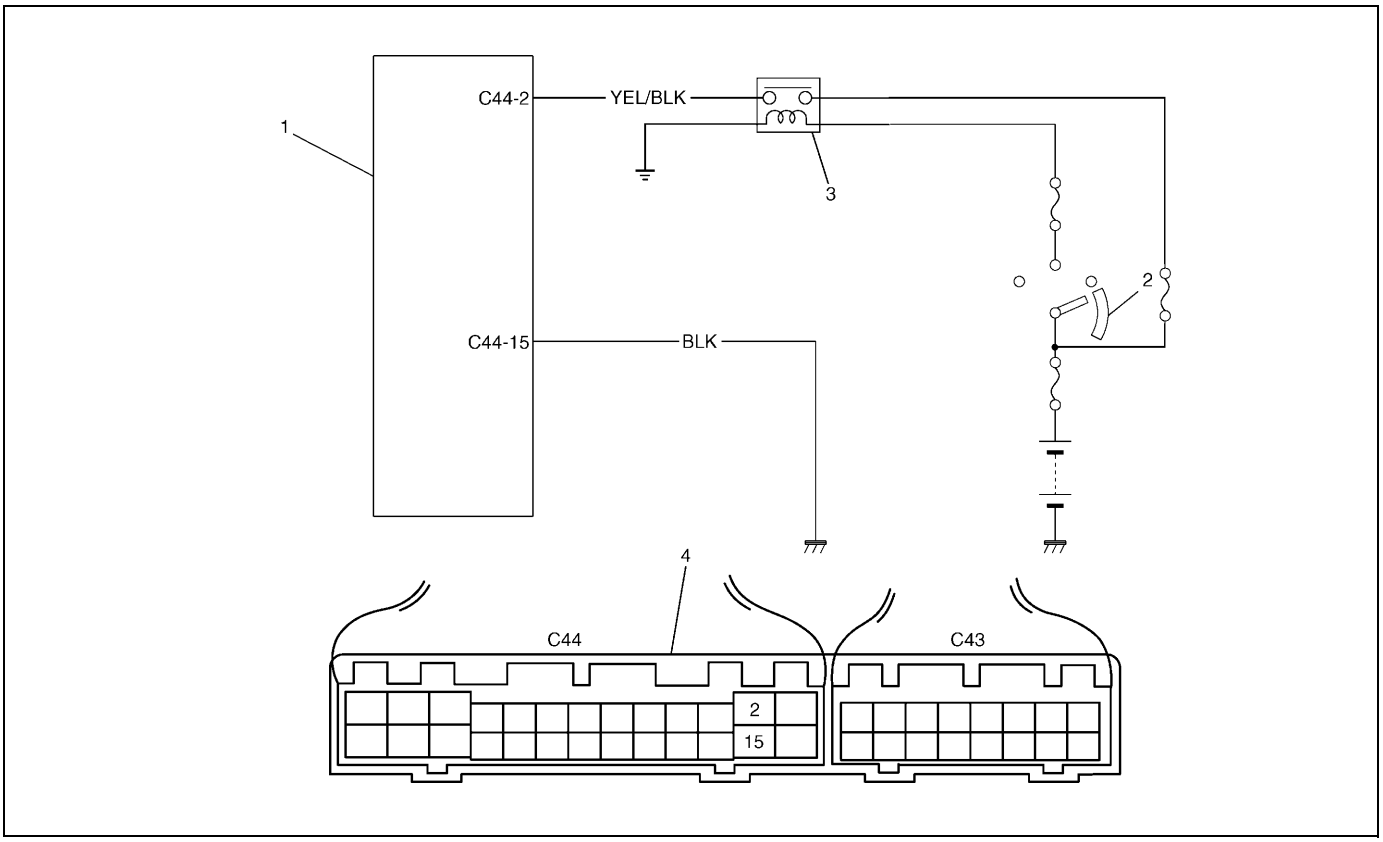
DTC P0702/P1702 (DTC No.52)TRANSMISSION CONTROL SYSTEM ELECTRICAL OR INTERNAL MALFUNCTION OF TCM



1. TCM	3. A/T relay
2. Ignition switch	4. TCM coupler (viewed from harness side)

DTC DETECTING CONDITION
• Relay output voltage too high although TCM orders the relay to turn OFF or relay output voltage too low although TCM orders the relay to turn on. • Incorrect calculations of checking TCM programmed data indicated.

Step	Action	Yes	No
1	1) Turn ignition switch ON. 2) Erase all DTCs referring to “HOW TO CLEAR DTC” in this section. 3) Turn ignition switch OFF. 4) Turn ignition switch ON once again and check for any DTC. Is it DTC P1702 (DTC No.52) or P0702 (DTC No.52)?	Replace TCM.	Could be a temporary malfunction of the TCM.

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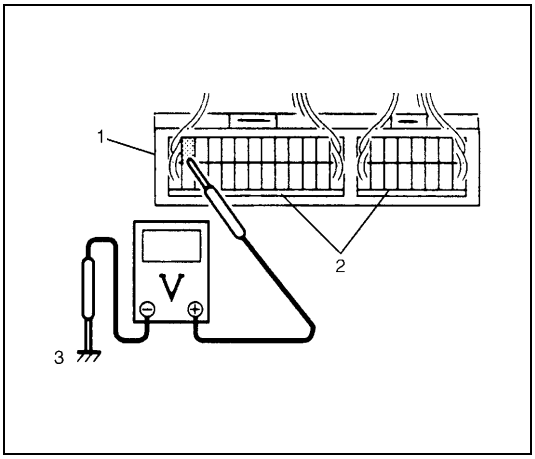
INSPECTION OF TCM AND ITS CIRCUITS

TCM and its circuits can be checked at TCM wiring couplers by measuring voltage and resistance.

CAUTION:
TCM cannot be checked by itself, it is strictly prohibited to connect voltmeter or ohmmeter to TCM with coupler disconnected from it.

INSPECTION

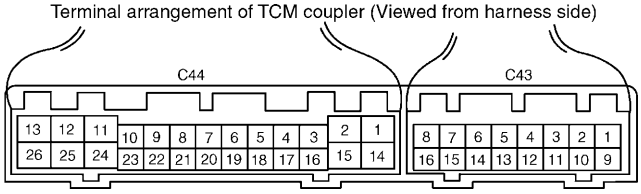


1) Remove TCM from vehicle referring to “TRANSMISSION CONTROL MODULE” in this section.
2) Connect TCM couplers to TCM.
3) Check voltage at each terminal of couplers connected.

NOTE:
As each terminal voltage is affected by the battery voltage, confirm that it is 11 V or more when ignition switch is ON.

1. TCM	3. Body ground
2. Couplers	

Terminal arrangement of TCM coupler (Viewed from harness side)



TERMINAL		CIRCUIT	STAN-DARD VOLTAGE	CONDITION
C43	1	Transmission range “P” switch	10 – 14 V	IG switch ON, selector lever at “P” range
			0 – 1 V	IG switch ON, selector lever other than “P” range
	2	Transmission range “R” switch	10 – 14 V	IG switch ON, selector lever at “R” range
			0 – 1 V	IG switch ON, selector lever other than “R” range
	3	Transmission range “N” switch	10 – 14 V	IG switch ON, selector lever at “N” range
			0 – 1 V	IG switch ON, selector lever other than “N” range
	4	Diagnosis switch	10 – 14 V	IG switch ON, diagnosis switch terminal not grounded
	5	Engine speed signal	0 – 1 V	IG switch ON, leaving engine OFF
	6	Output shaft speed sensor(+)	–	–
	7	Input shaft speed sensor(+)	–	–
	8	throttle opening signal	–	–
	9	Transmission range “D” switch	10 – 14 V	IG switch ON, selector lever at “D” range
			0 – 1 V	IG switch ON, selector lever other than “D” range
	10	Transmission range “2” switch	10 – 14 V	IG switch ON, selector lever at “2” range
			0 – 1 V	IG switch ON, selector lever other than “2” range
	11	Transmission range “L” switch	10 – 14 V	IG switch ON, selector lever at “L” range
			0 – 1 V	IG switch ON, selector lever other than “L” range

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TERMINAL		CIRCUIT	STAN-DARD VOLTAGE	CONDITION
C43	12	Serial data link (SUZUKI scan tool)	10 – 14 V	IG switch ON
	13	Output shaft speed sensor shield	–	–
	14	Output shaft speed sensor(–)	–	–
	15	Input shaft speed sensor(–)	–	–
C44	2	IG power source	10 – 14 V	IG switch ON
	3	Transmission temperature sensor	0 – 4.5 V	IG switch ON
	4	Brake switch	10 – 14 V	IG switch ON, brake pedal depressed
	5	A/C compressor	0 – 2 V	A/C OFF
			10 – 14 V	A/C ON
	8	Idle up signal	10 – 14 V	Selector lever at “P” or “N” range
			0 – 1 V	Selector lever other than “P” or “N” range
	10	Shift solenoid-A (No.1)	0 – 1 V	IG switch ON, select lever at “P” range
	11	Shift solenoid-C (Dropping resistor)	0 – 1 V	IG switch ON, select lever at “P” range
	12	Shift solenoid-D (Dropping resistor)	10 – 14 V	IG switch ON, select lever at “P” range
	13	Shift solenoid-E (Dropping resistor)	0 – 1 V	IG switch ON, select lever at “P” range
	15	Ground	–	–
	16	Transmission temperature sensor ground	–	–
	17	O/D off switch (Type A) SEE NOTE	0 – 1 V	IG switch ON, O/D off switch ON
			10 – 14 V	IG switch ON, O/D off switch OFF
		O/D off switch (Type B) SEE NOTE	0 – 1 V	IG switch ON, O/D off switch PRESS
			10 – 14 V	IG switch ON, O/D off switch RELEASE
	18	Engine coolant temperature/ Barometric pressure signal	–	–
	20	A/T failure serial data	0 – 1 V	IG switch ON
	21	O/D OFF lamp	10 – 14 V	IG switch ON, O/D off switch OFF
			0 – 1 V	IG switch ON, O/D off switch ON
	22	Lock-up solenoid	0 – 1 V	IG switch ON, selector lever at “P” range
	23	Shift solenoid-B (No.2)	0 – 1 V	IG switch ON, selector lever at “P” range
	24	Shift solenoid-C (No.3)	0 – 1 V	IG switch ON, selector lever at “P” range
	25	Shift solenoid-D (No.4)	2.2 – 4.9 V	IG switch ON, selector lever at “P” range
	26	Shift solenoid-E (No.5)	0 – 1 V	IG switch ON, selector lever at “P” range

NOTE:

Type A: Sequential type switch
Type B: Momentary type switch

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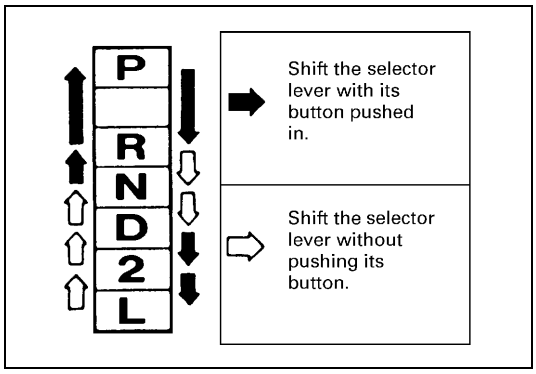
ON-VEHICLE SERVICE

MAINTENANCE SERVICE

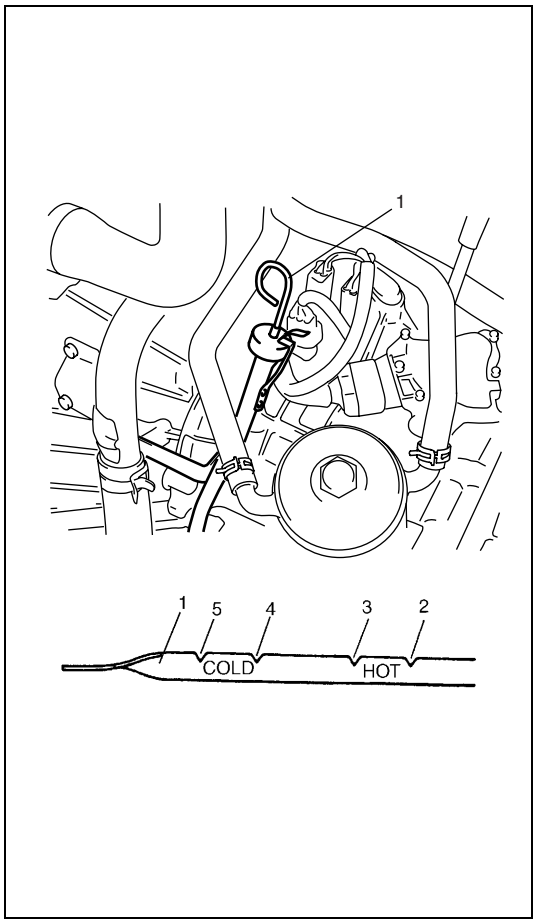
FLUID LEVEL AT NORMAL OPERATING TEMPERATURE

INSPECTION

1) Stop vehicle and place it level.
2) Apply parking brake and place chocks against wheels.
3) With selector at P position, start engine.
4) Warm up engine till fluid temperature reaches normal operating temperature (70 – 80°C/158 – 176°F). As a guide to check fluid temperature, warm up engine to normal operating temperature.



5) Keep engine idling and shift selector slowly to L and back to P position.
6) With engine idling, pull out dipstick, wipe it off with a clean cloth and put it back into place.



7) Pull out dipstick (1) again and check fluid level indicated on it. Fluid level should be between FULL HOT and LOW HOT. If it is below LOW HOT, add an equivalent of DEXRON®-III or DEXRON®-IIE up to FULL HOT.

A/T fluid specification

: An equivalent of DEXRON®-III or DEXRON®-IIE

NOTE:

- **DO NOT RACE ENGINE while checking fluid level, even after the engine start.**
- **DO NOT OVERFILL. Overfilling can cause foaming and loss of fluid through breather. Then slippage and transmission failure can result.**
- **Bringing the level from LOW HOT to FULL HOT requires 0.35 liters (0.74/0.62 US/Imp. pt).**
- **If vehicle was driven under high load such as pulling a trailer, fluid level should be checked about half an hour after it is stopped.**

2. “FULL HOT” mark
3. “LOW HOT” mark
4. “FULL COLD” mark
5. “LOW COLD” mark

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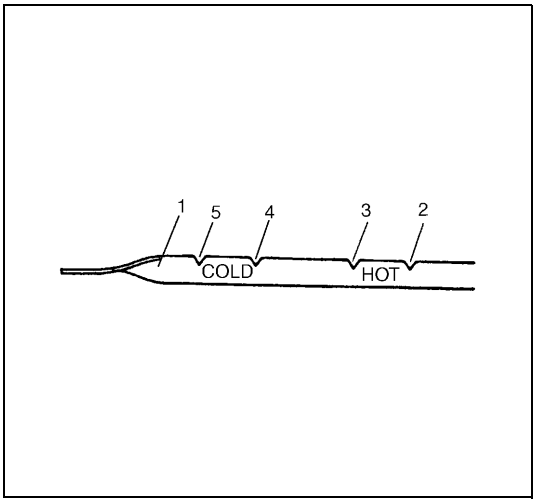
FLUID LEVEL AT ROOM TEMPERATURE

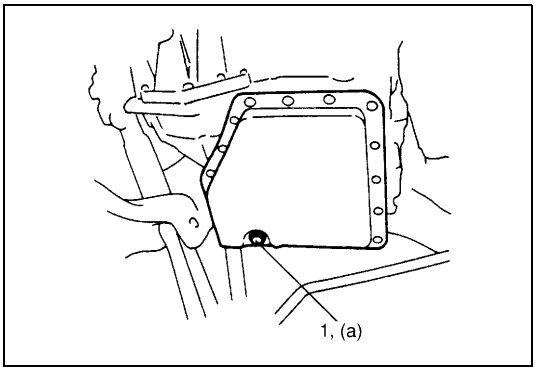
INSPECTION



The fluid level check at room temperature performed after repair or fluid change before test driving is just preparation for level check of normal operation temperature. The checking procedure itself is the same as that described previously. If the fluid level is between FULL COLD and LOW COLD, proceed to test drive. And when the fluid temperature has reached the normal operating temperature, check fluid again and adjust it as necessary.

1. Dipstick
2. “FULL HOT” mark
3. “LOW HOT” mark
4. “FULL COLD” mark
5. “LOW COLD” mark

FLUID CHANGE



1) Lift up vehicle.
2) When engine has cooled down, remove drain plug (1) from oil pan and drain A/T fluid.
3) Install drain plug.

Tightening torque
A/T fluid drain plug (a) : 23 N·m (2.3 kg-m, 16.5 lb-ft)

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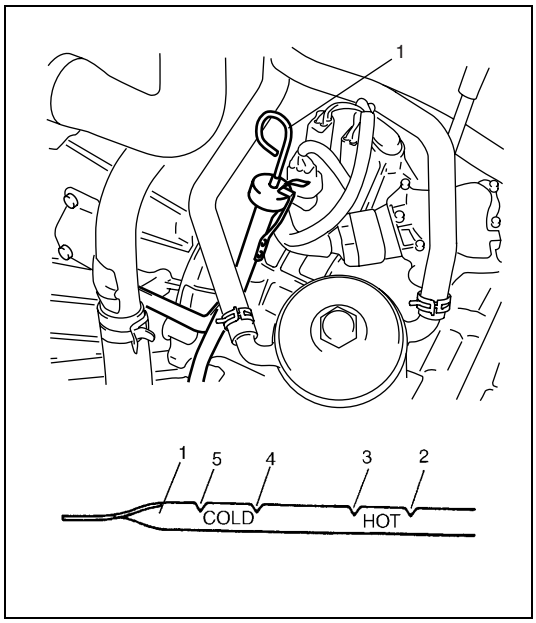


1.	Dipstick
2.	“FULL HOT” mark
3.	“LOW HOT” mark
4.	“FULL COLD” mark
5.	“LOW COLD” mark

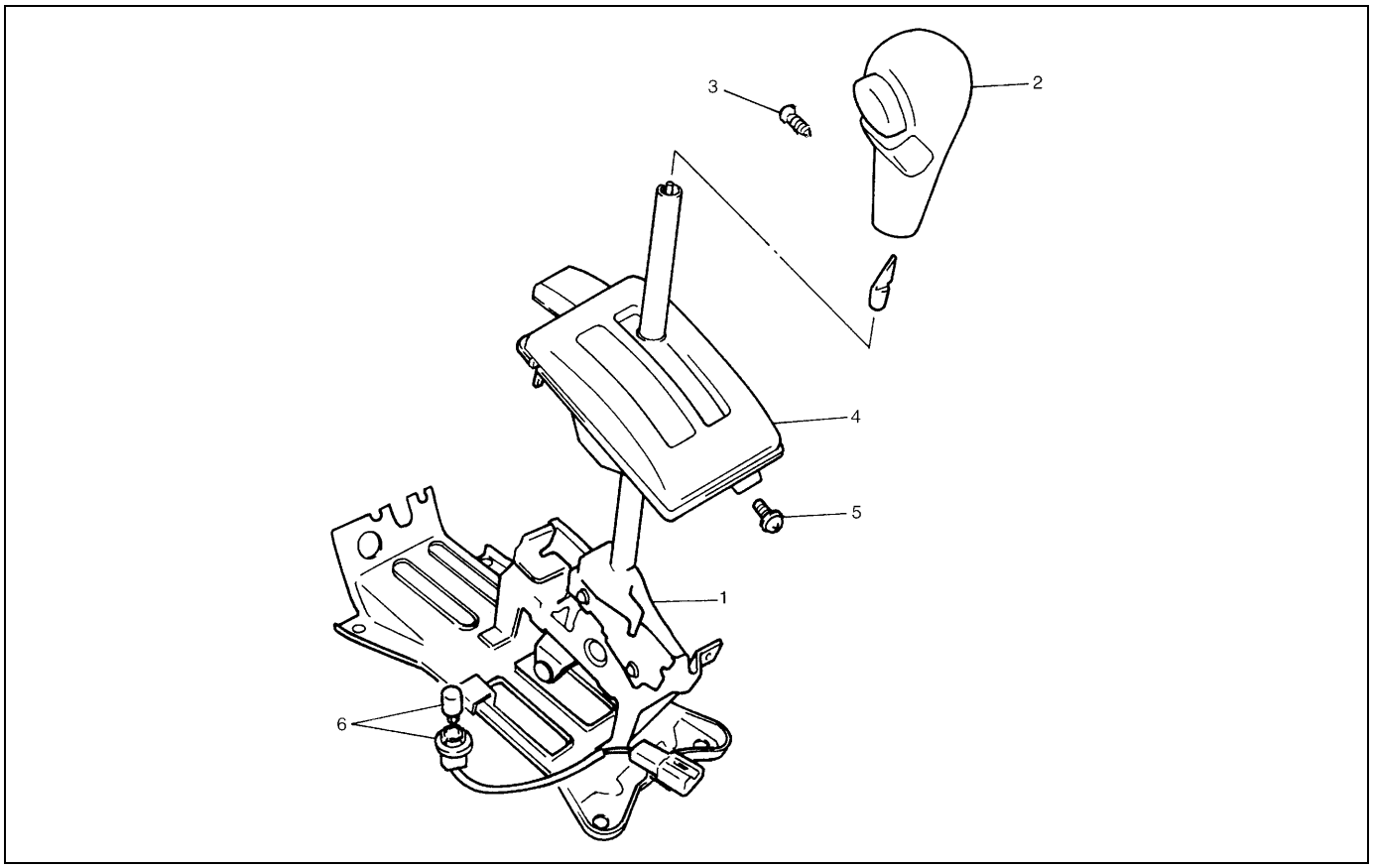
4) Lower vehicle and fill proper amount of an equivalent of DEXRON®-III or DEXRON®-IIE
5) Check fluid level according to procedure described under “FLUID LEVEL AT NORMAL OPERATING TEMPERATURE.

A/T fluid specification

: An equivalent of DEXRON®-III or DEXRON®-IIE

A/T fluid capacity
When draining from drain plug hole :
4.0 liters (8.45/7.04 US/Imp. pt.)
When overhauling :
5.1 liters (10.78/8.98 US/Imp. pt.)

SELECTOR LEVER



1. Selector lever assembly	4. Selector indicator assembly
2. Selector lever knob assembly	5. Screw
3. Screw	6. Illumination lamp assembly

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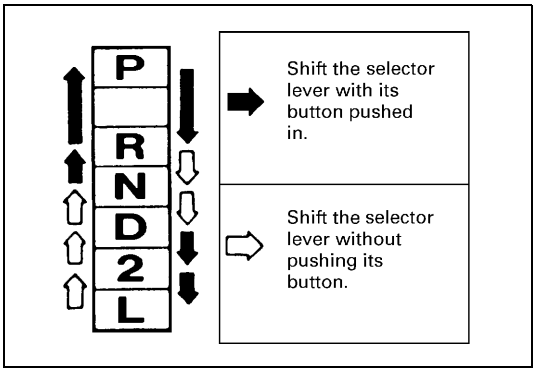


INSPECTION

Check selector lever for smooth and clear cut movement and position indicator for correct indication.
For operation of selector lever, refer to the figure.

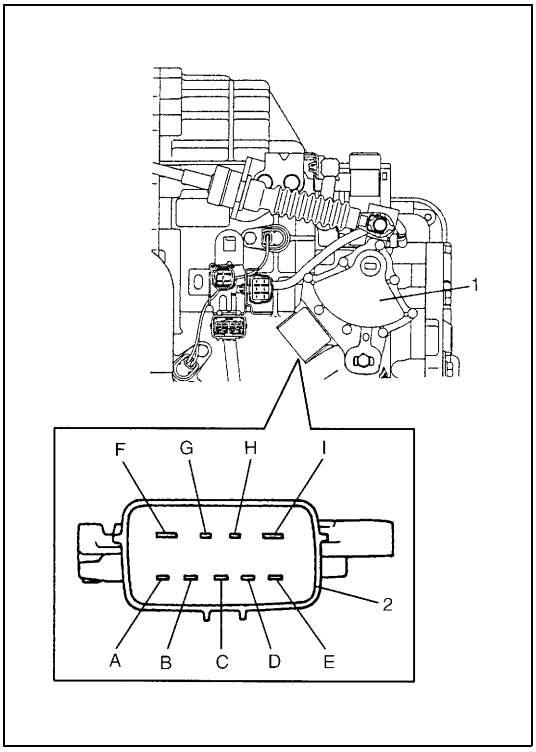
TRANSMISSION RANGE SENSOR (SHIFT SWITCH)

REMOVAL

1) Block wheels and turn select lever to “N” range.
2) Disconnect transmission range sensor coupler and select cable.
3) Remove transmission range sensor from transmission case.

CAUTION:
Do not overhaul transmission range sensor.

INSPECTION



1) Disconnect transmission range sensor coupler (2).
2) Check that continuity exists at terminals shown below by moving selector lever.

Sensor Position \ Terminal	B	A	H	C	E	D	G	I	F
P	○						○	○	○
R		○					○		
N			○				○	○	○
D				○			○		
2					○		○		
L						○	○		

1. Transmission range sensor

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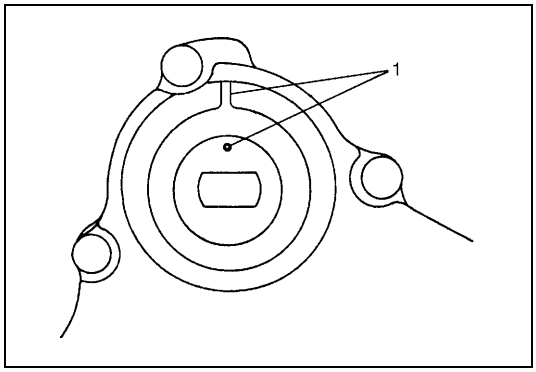
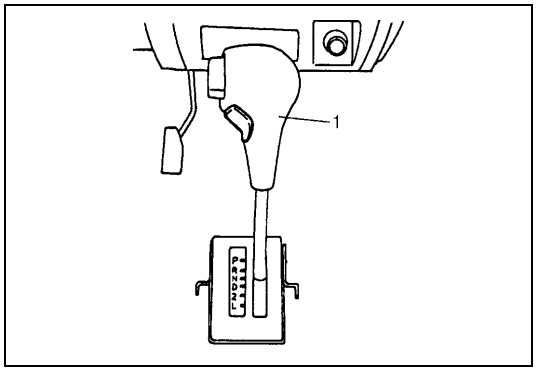
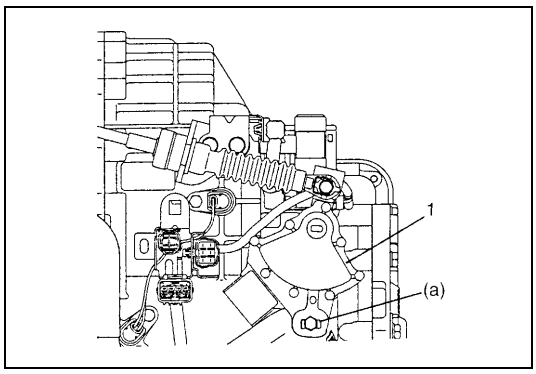
INSTALLATION



1) Using flat tip screwdriver, turn transmission range sensor to have the match marks (1) line up (transmission range sensor “N” range).



2) Turn selector lever (1) to “N” range (to have the automatic transmission to “N” range).



3) Install transmission range sensor (1) to transmission case.

Tightening torque
Transmission range sensor bolt
(a) : 18 N·m (1.8 kg-m, 13.0 lb-ft)

4) Move selector lever in cabin to each range and check the continuity of each terminal of transmission range sensor referring to “INSPECTION”.
5) Connect transmission range sensor coupler.
6) Check that the engine can only be started in “N” and “P” range, but can not in “D”, “2”, “L” or “R” range. Also, check that backup lamp come ON at “R” range.

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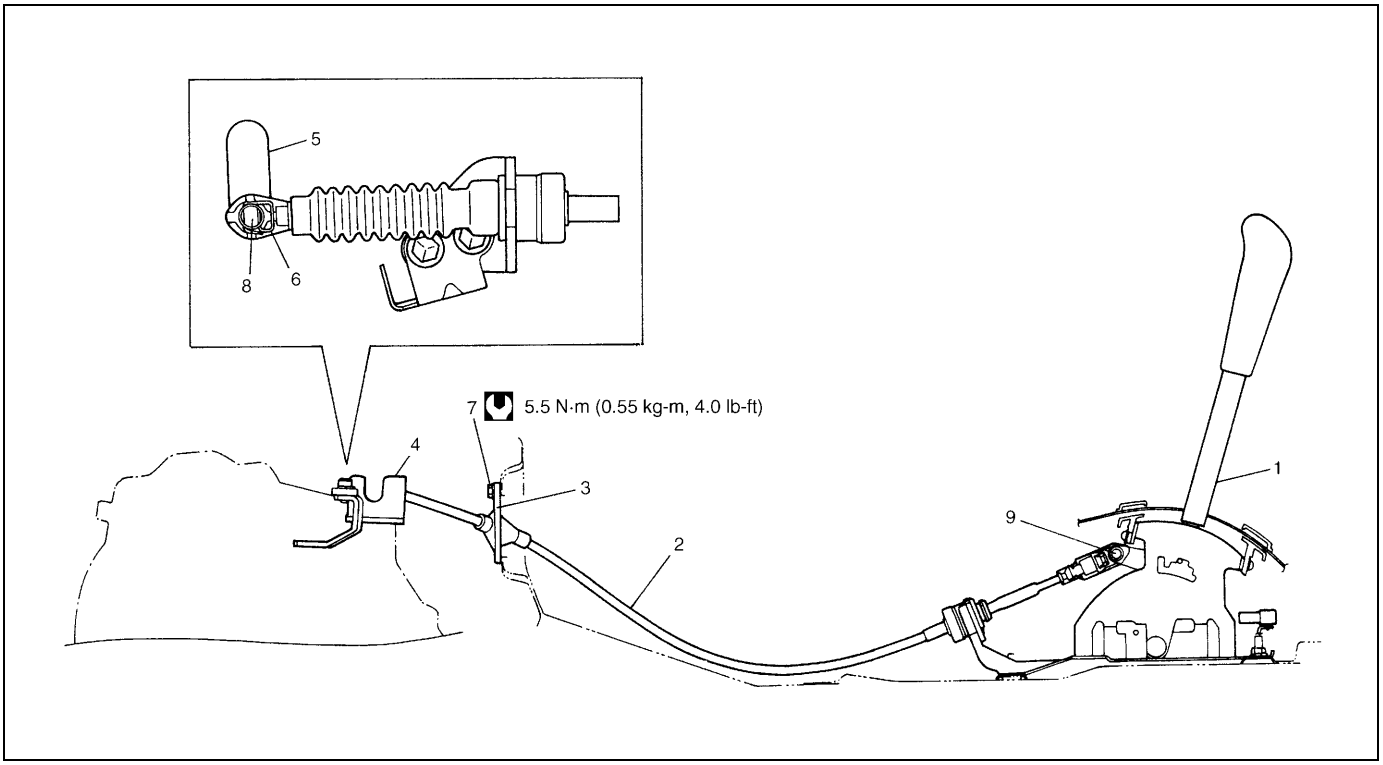
SELECTOR CABLE



1. Selector lever assembly		6. Clip
2. Selector cable		7. Selector housing bolt
3. Selector housing	A	8. Shift control lever pin : Apply lithium grease 99000-25010 to all around pin (0.15 g)
4. Cable bracket	A	9. Selector lever pin : Apply lithium grease 99000-25010 to all around pin (0.15 g)
5. Shift control lever		Tightening torque

REMOVAL

1) Remove parking brake lever cover.
2) Remove console box.
3) Disconnect selector cable from selector lever and then detach from bracket.
4) Remove clip and disconnect selector cable from transmission.
5) Remove selector housing from dash panel.

INSTALLATION

Install selector cable by reversing removal procedure.
The important steps in installation are as follows.

- Apply grease to pin and cable joint.
- Tighten bolts and nut in upper figure to specified torque.
- Adjusting procedure is as follows.

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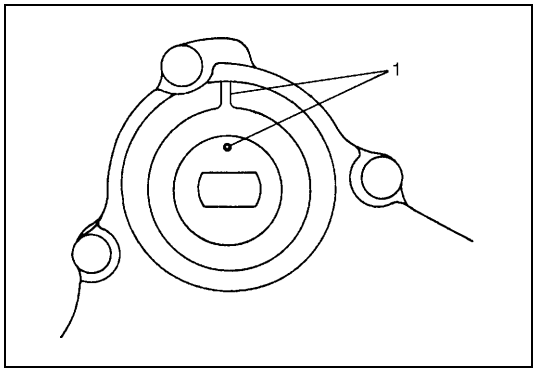
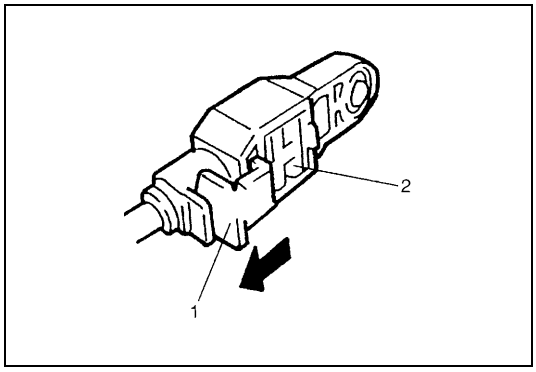
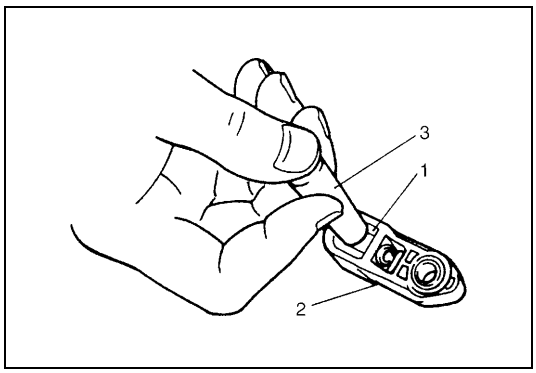
ADJUSTMENT



1) Turn transmission range sensor to have the match marks (1) line up (transmission range sensor “N” range).
2) Remove adjuster (cable end) from selector pin.



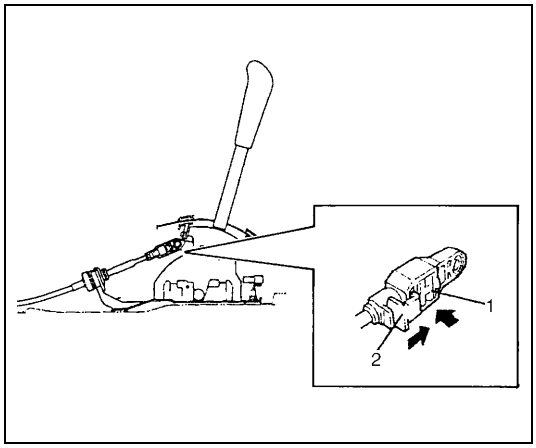
3) Release lock plate (1) which restrict moving of cable end holder (2).



4) Push cable end holder (1) out from eye-end (2) using an appropriate tool (3) to disengage cable.

5) Shift selector lever to “N” position.
6) Apply grease to selector pin and install adjuster (cable end) to it.

Grease : 99000-25010



7) With both selector lever and transmission range sensor kept each “N” position, drive cable end holder (1) in until it locks cable.
8) Slide lock plate (2) to secure cable end holder in position.
9) After selector rod was installed, check for the following.
   - Push vehicle with selector lever shifted to “P” range. Vehicle should not move.
   - Vehicle can not be driven in “N” range.
   - Vehicle can be driven in “D”, “2” and “L” ranges.
   - Vehicle can be backed in “R” range.

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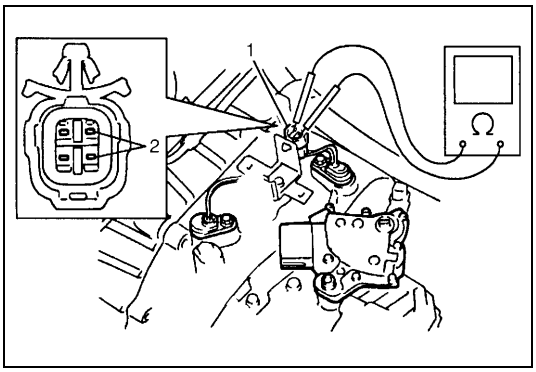
OUTPUT SHAFT SPEED SENSOR (A/T VSS)

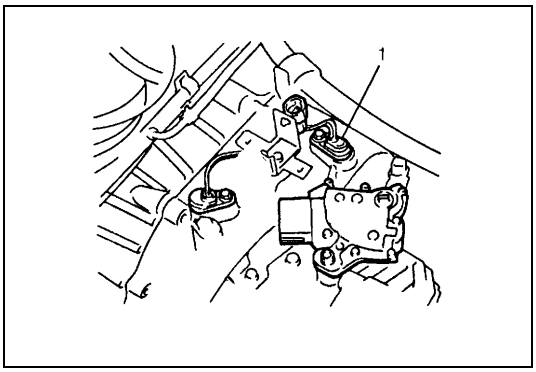
INSPECTION



1) Disconnect negative cable at battery.
2) Disconnect output shaft speed sensor – input shaft speed sensor coupler (1).
3) Check resistance between output shaft speed sensor terminals (2).

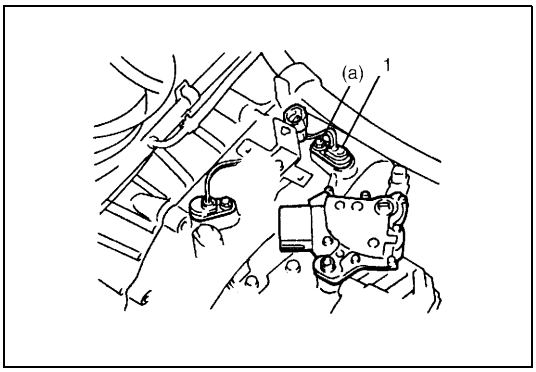
Output shaft speed sensor resistance
Standard : 160 – 200 Ω at 20°C (68°F)

REMOVAL



1) Disconnect negative cable at battery.
2) Disconnect output shaft speed sensor – input shaft speed sensor coupler.
3) Remove output shaft speed sensor (1) by removing its bolt.

INSTALLATION



1) Apply A/T fluid to output shaft speed sensor o-ring.
2) Install output shaft speed sensor (1) to A/T case and tighten bolt to specified torque.

Tightening torque
Output shaft speed sensor bolt
(a) : 8 N·m (0.8 kg-m, 6.0 lb-ft)

3) Connect output shaft speed sensor – input shaft speed sensor coupler.
4) Connect negative cable to battery.

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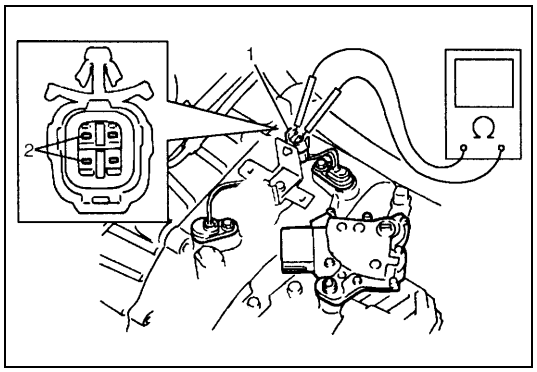
INPUT SHAFT SPEED SENSOR

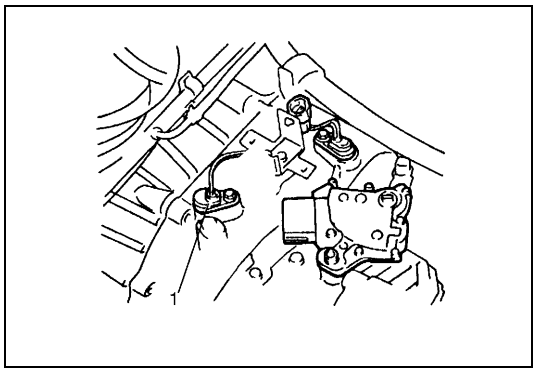
INSPECTION



1) Disconnect negative cable at battery.
2) Disconnect output shaft speed sensor – input shaft speed sensor coupler (1).
3) Check resistance between input shaft speed sensor terminals (2).

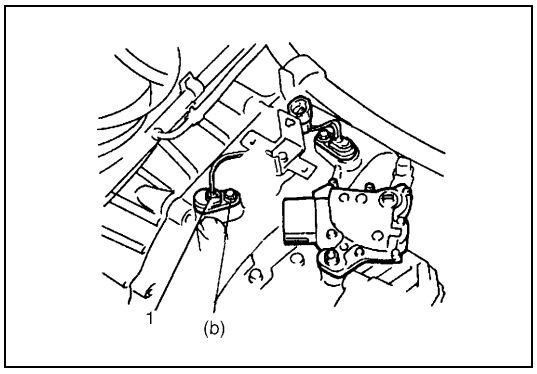
Input shaft speed sensor resistance
Standard : 160 – 200 Ω at 20°C (68°F)

REMOVAL



1) Disconnect negative cable at battery.
2) Disconnect output shaft speed sensor – input shaft speed sensor coupler.
3) Remove input shaft speed sensor (1) by removing its bolt.

INSTALLATION



1) Apply A/T fluid to input shaft speed sensor O-ring.
2) Install input shaft speed sensor (1) to A/T case and tighten bolt to specified torque.

Tightening torque
Input shaft speed sensor bolt
(b) : 8 N·m (0.8 kg-m, 6.0 lb-ft)

3) Connect output shaft speed sensor – input shaft speed sensor coupler.
4) Connect negative cable to battery.

VEHICLE SPEED SENSOR (VSS)

Refer to Section 6E for removal, installation and inspection.

THROTTLE POSITION SENSOR

INSPECTION

Check throttle position sensor referring to Section 6E.

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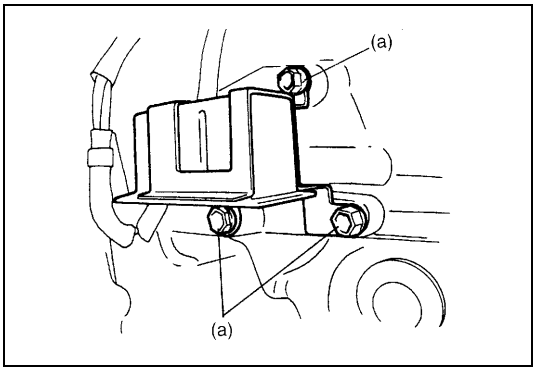
ENGINE COOLANT TEMP. (ECT) SENSOR

INSPECTION

Check engine coolant temp. sensor referring to Section 6E.

DROPPING RESISTOR

REMOVAL/INSTALLATION

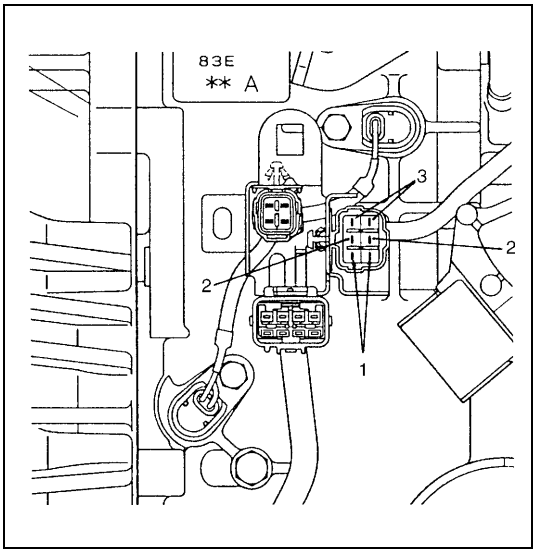


Refer to the figure for removal/installation.

Tightening torque
Dropping resistor bolts
(a) : 20 N·m (2.0 kg-m, 14.5 lb-ft)

INSPECTION

Measure resistance between each resistor terminals.



Dropping resistor resistance

CIRCUIT	RESISTANCE
Shift solenoid -C (No.3)	6.5 – 8.5 Ω
Shift solenoid -D (No.4)	6.5 – 8.5 Ω
Shift solenoid -E (No.5)	6.5 – 8.5 Ω

1. Resistor terminal for shift solenoid -C Circuit
2. Resistor terminal for shift solenoid -D Circuit
3. Resistor terminal for shift solenoid -E Circuit

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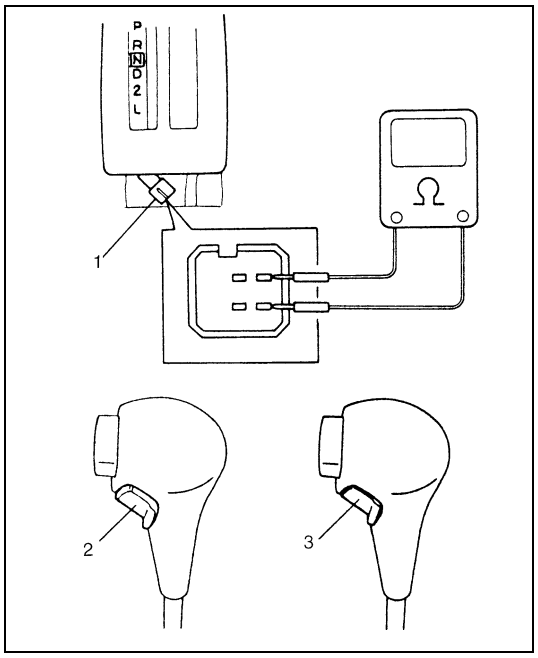
O/D OFF SWITCH

INSPECTION

1) Remove console box.



2) Disconnect O/D off switch coupler (1).
3) Check continuity between O/D off switch terminals.

O/D OFF switch specification
[Type A]

O/D off switch	ON	OFF
Continuity	Continuity	No continuity

[Type B]

O/D off switch	PRESS	FREE
Continuity	Continuity	No continuity

2. For type A: O/D off switch ON For type B: O/D off switch FREE
3. For type A: O/D off switch OFF For type B: O/D off switch PRESS

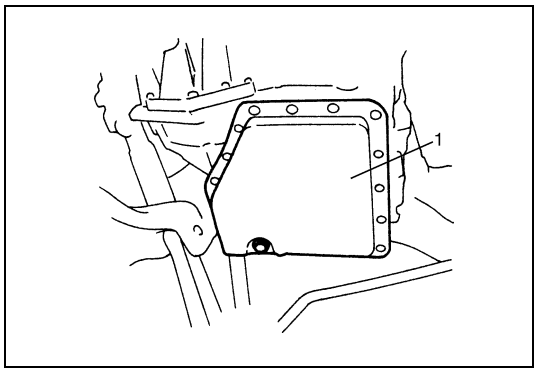
NOTE:

For type B O/D off switch model, TCM is initialized when ignition switch is turned off and O/D returns in the condition of ON.

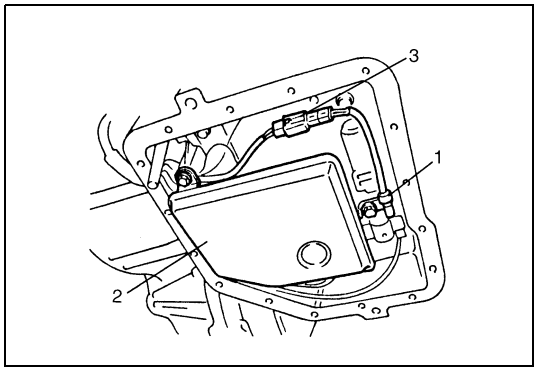
SHIFT SOLENOID VALVES AND TRANSMISSION TEMPERATURE SENSOR

REMOVAL

1) Disconnect negative cable at battery.
2) Drain A/T fluid.



3) Remove A/T oil pan (1).



4) Disconnect transmission temp. sensor coupler (3).
5) Remove A/T oil strainer (2) and transmission temp. sensor (1).

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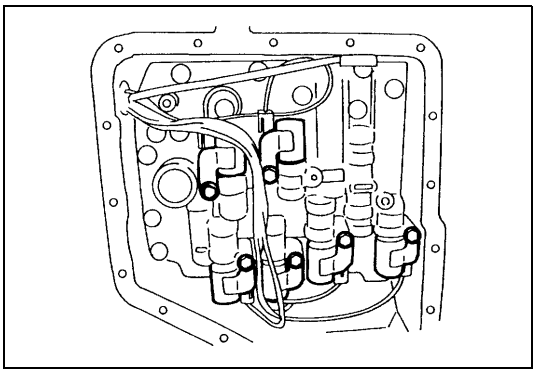
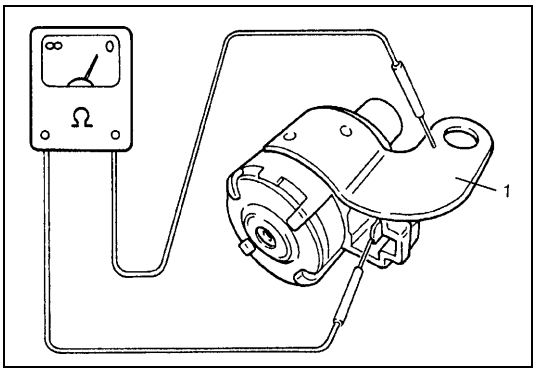


6) Disconnect shift solenoid couplers.
7) Remove shift solenoid valves.

SHIFT SOLENOID VALVES

INSPECTION

Resistance Check



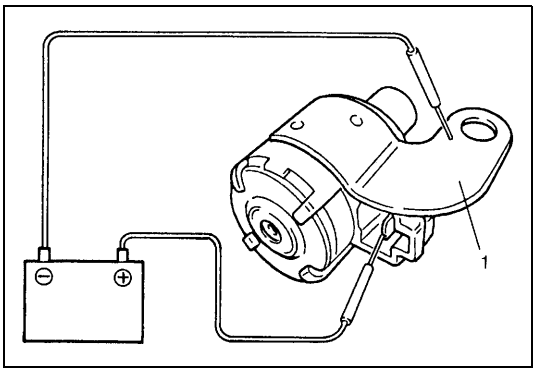
- Shift solenoid A (No.1), B (No.2) and lock-up solenoid
  Resistance between terminal and solenoid body
  Standard : 10.5 – 15.5 Ω

- Shift solenoid C (No.3), D (No.4) or E (No.5)

  Resistance between terminal and solenoid body
  Standard : 2.5 – 3.5 Ω

1. Solenoid valve

Operation check

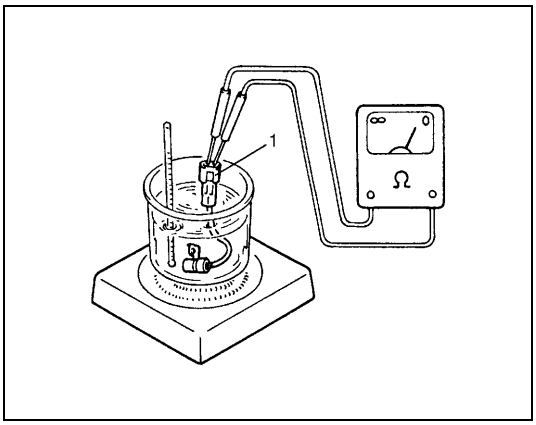


When solenoids is connected to the battery as shown in figure, check that the solenoid actuates with a click sound.

1. Solenoid valve

TRANSMISSION TEMPERATURE SENSOR

INSPECTION



Warm up transmission temp. sensor. Thus make sure its resistance decrease with the increase of temperature.

Transmission temperature sensor resistance

Temperature	Resistance
20°C (68°F)	2.5 kΩ
40°C (104°F)	1.2 kΩ
60°C (140°F)	0.6 kΩ

1. Transmission temperature sensor coupler

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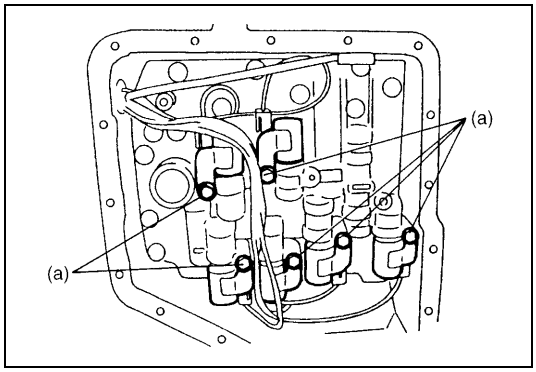
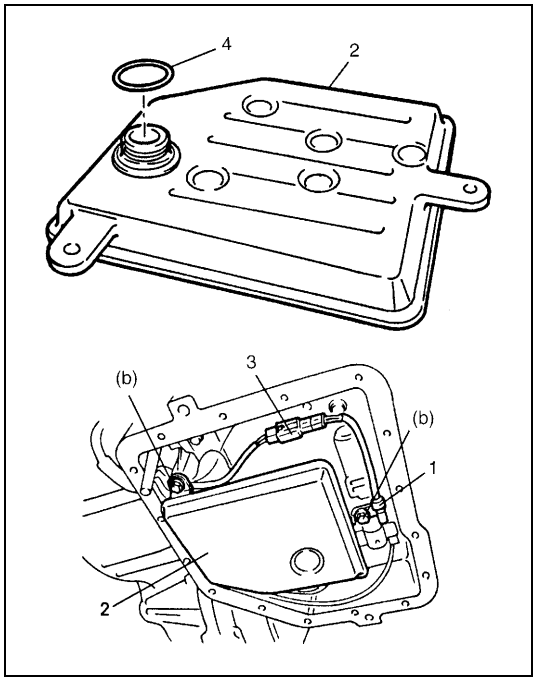
INSTALLATION



1) Install shift solenoid valves.

Tightening torque
Solenoid valve bolts (a) : 8 N·m (0.8 kg-m, 6.0 lb-ft)

2) Connect shift solenoid couplers.

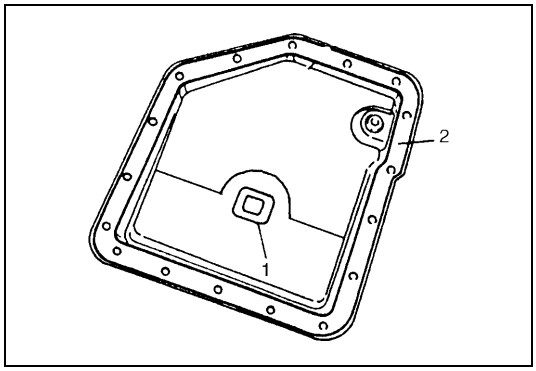


3) Install oil strainer (2) and transmission temperature sensor (1).

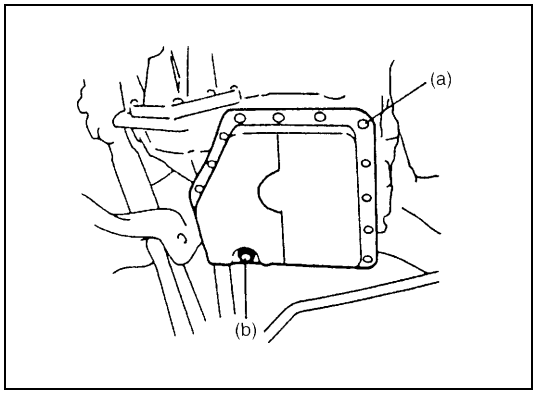
Tightening torque
Transmission temperature sensor bolt
(b) : 10 N·m (1.0 kg-m, 7.5 lb-ft)

NOTE:
Do not forget to install O-ring (4) to oil strainer first.

4) Connect transmission temperature sensor coupler (3).



5) Clean mating surface of A/T oil pan (1) and A/T case.
6) Install new gasket (2) to A/T oil pan.



7) Install A/T oil pan.

Tightening torque
A/T oil pan bolts (a) : 7.5 N·m (0.75 kg-m, 5.5 lb-ft)

8) Install A/T fluid drain bolt.

Tightening torque
A/T fluid drain bolt (b) : 23 N·m (2.3 kg-m, 16.5 lb-ft)

9) Refill A/T fluid referring to “FLUID CHANGE” in this section.
10) Verify that there is no A/T fluid leakage.

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DIFFERENTIAL SIDE OIL SEAL

REPLACEMENT

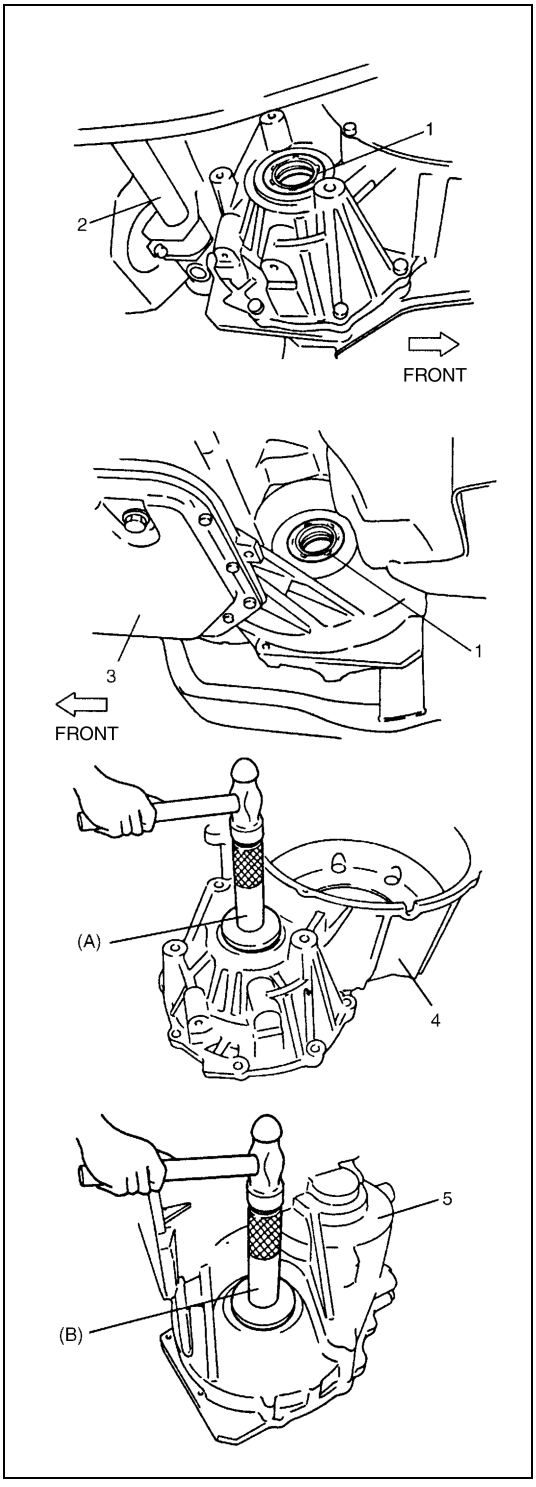
1) Lift up vehicle and drain transmission oil.
2) Remove drive shaft joints from differential gear of transmission.
   Refer to Section 4 for procedure to disconnect drive shaft joints.
   For differential side oil seal removal, it is not necessary to remove drive shafts from steering knuckle.
   For 4WD vehicle, remove transfer referring to Section 7D.
3) Remove differential side oil seal (1) by using flat end rod or like.
4) Install new differential side oil seal by using special tool.

NOTE:

For oil seal installation, press-fit oil seal so that transmission case end face is flush with oil seal end face.

Special tool
(A) : 09940-53111
(B) : 09913-75510

5) Install drive shaft referring to Section 4.
6) Refill A/T fluid referring to “FLUID CHANGE” in this section.



2.	Steering gear box
3.	A/T oil pan
4.	Torque converter housing
5.	Transmission case

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TRANSMISSION CONTROL MODULE (TCM)

CAUTION:

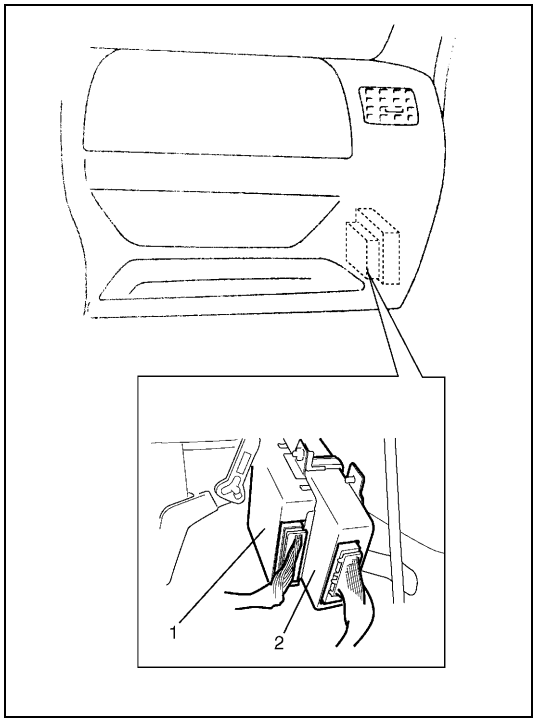
TCM and ECM consist of highly precise parts, so when handling it (or them), be careful not to expose to excessive shock.

NOTE:

When replacing TCM with used one, all learned contents which are stored in TCM memory should be erased referring to "LEARNING CONTROL INITIALIZATION" in this section.

REMOVAL

1) Disconnect negative cable at battery.
2) If the vehicle is equipped with air bag system, disable air bag system. Refer to "DISABLING AIR BAG SYSTEM" in Section 10B.



3) Disconnect couplers from TCM (1) and ECM (2).
4) Loosen bolt and nuts and remove TCM (1) together with ECM (2) from vehicle.

INSTALLATION

Reverse removal procedure noting the following.

- Connect ECM and TCM couplers securely.
- If the vehicle is equipped with air bag system, be sure to enable air bag system after TCM and ECM are back in place. Refer to "ENABLING AIR BAG SYSTEM" in Section 10B.

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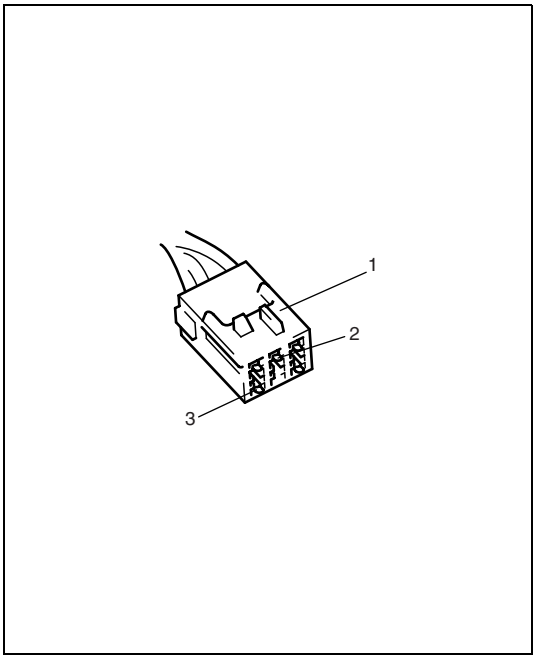
LEARNING CONTROL INITIALIZATION

When one or more operations such as shown below are performed, all learned contents which are stored in TCM memory should be erased after the operations.

- Replacing transmission with new or used one.
- Repairing transmission partially by replacing any brake component parts with new and/or used brake disc(s), plate(s) and/or flange.
- Repairing transmission partially by replacing any clutch component parts with new and/or used clutch disc(s), plate(s) and/or flange.
- Replacing TCM with used one.

1) Turn ignition switch ON, leaving engine OFF.
2) Using service wire, connect diagnosis switch terminal (2) with ground terminal (3) of monitor connector No.2 (1).
3) Shift selector lever from "D" range to "2" range 3 times repeatedly within 10 seconds with diagnosis switch terminal (2) kept on connecting with ground.
4) Check DTC referring to "DTC CHECK" in this section and confirm that only DTC No.12 is displayed.
   If not, repeat Step 1) to Step 3) and check again.



NOTE:

- **"O/D OFF" lamp lights during initializing.**
- **Diagnostic trouble code(s) (DTC(s)) also are erased by performing this initializing procedure.**
- **After initializing is achieved, DTC No.12 is stored in TCM. If initializing is failed, DTC No.52 is stored in TCM.**

BRAKE INTERLOCK SYSTEM (IF EQUIPPED)

SHIFT LOCK SOLENOID CONTROL

This system consists of shift lock solenoid control system and interlock cable control system.

The shift lock solenoid control system is so designed that the selector lever can not be shifted from "P" range position unless ignition switch is turned ON and the brake pedal is depressed.

And interlock cable control system is so designed that select lever cannot be shifted from "P" range position unless ignition switch is turned to "ACC" or "ON" position. Also, ignition key cannot be pulled out of key slot unless selector lever is in "P" range.

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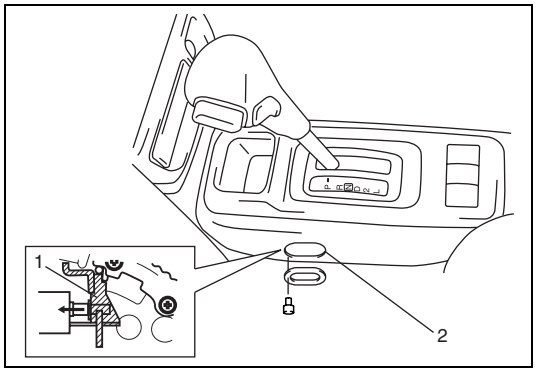
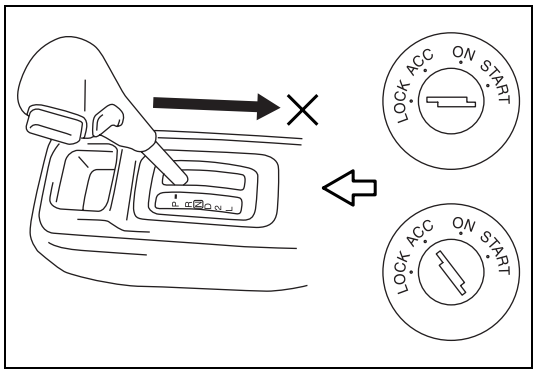
SHIFT LOCK SOLENOID MANUAL RLEASE

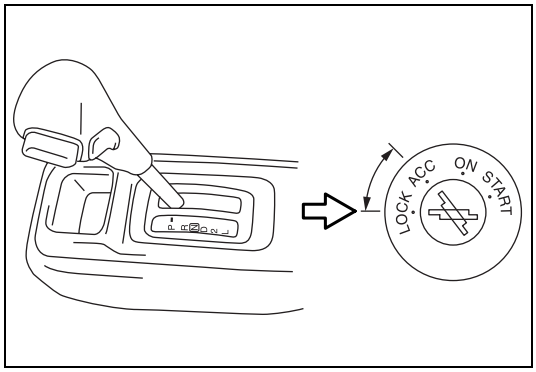


Without using brake pedal, shift lock can be moved by pushing shift lock solenoid cam (1) with screw driver or like through hole (2). (To shift selector lever from “P” range to any other position, turn ignition switch to “ACC” or “ON” position.)

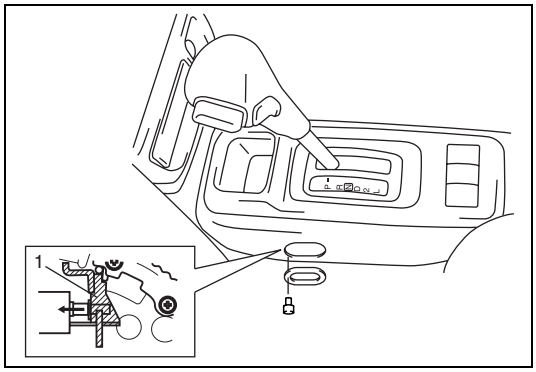
INSPECTION



1) Check to make sure that selector lever cannot be moved to any other range from “P” range position when ignition switch key is at “ACC” position, at “LOCK” position (or it is removed from keyhole of ignition switch) or brake pedal is not depressed.



2) Shift selector lever to “P” range position, release knob button and check for the following.
- Ignition key can be turned between “LOCK” and “ACC” positions back and forth and also it can be removed from ignition switch.



- With shift lock solenoid cam (1) moved in arrow direction and ignition key turned to “ACC” position, selector lever can be shifted from “P” range position to any other range.
- With shift lock solenoid cam moved in arrow direction and ignition key turned to “LOCK” position, selector lever can not be shifted from “P” range position to any other range.

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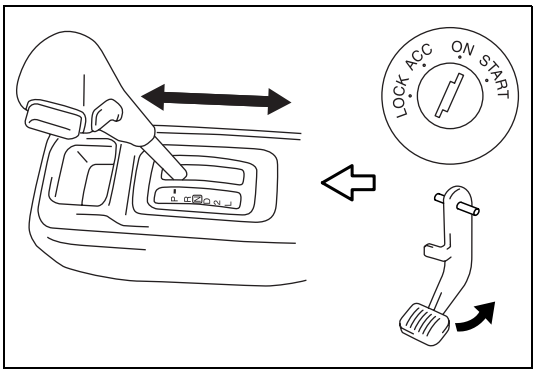
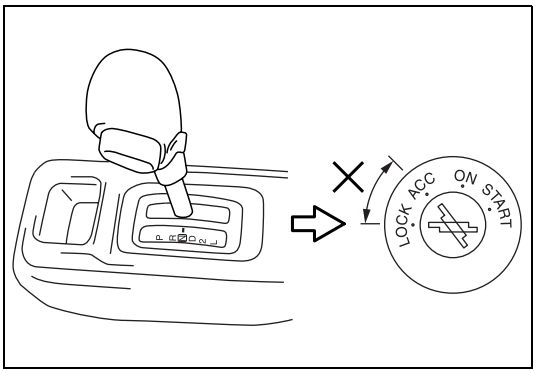
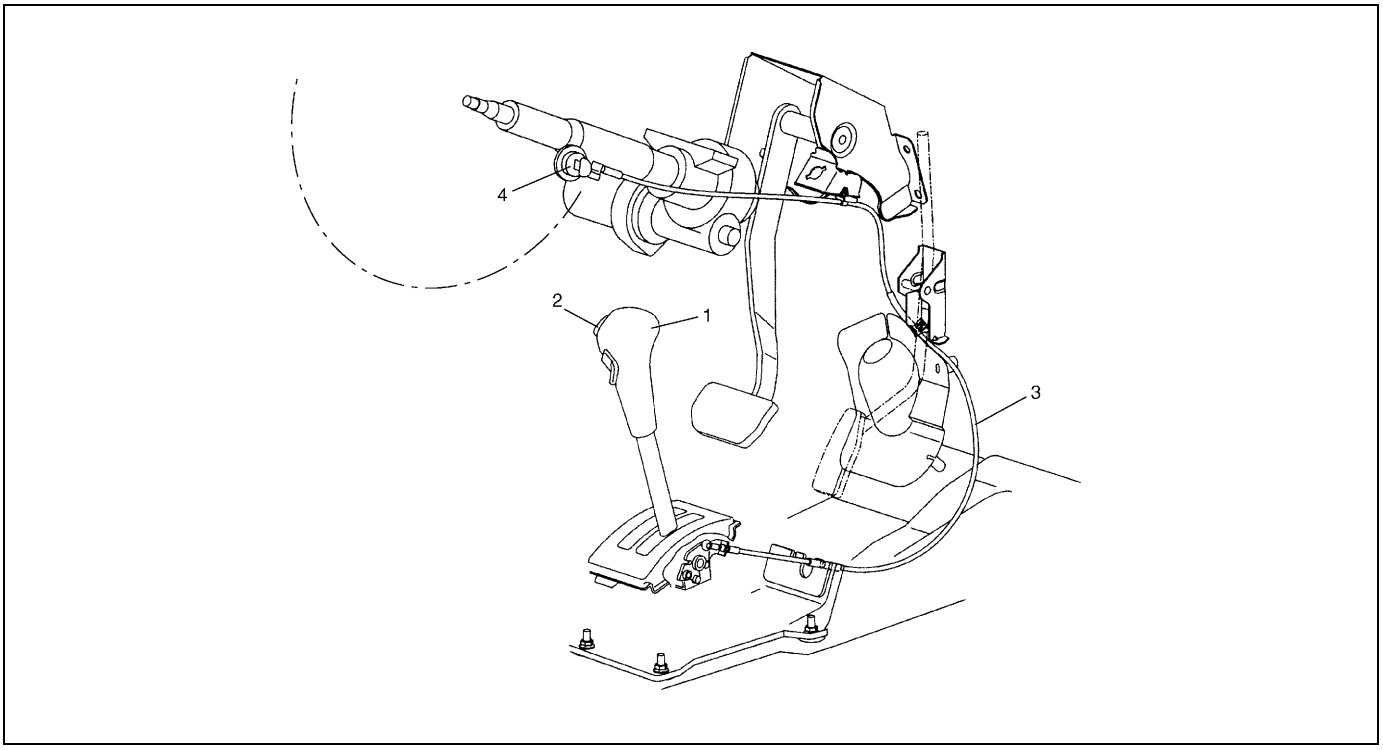


- When ignition switch is turned “ON” and brake pedal is depressed, selector lever can be shifted from “P” range position to any other range.



3) With ignition lever shifted to any position other than “P” range, check that ignition key cannot be turned “LOCK” position and it cannot be removed from ignition switch unless it is at “LOCK” position.

KEY INTERLOCK CABLE (IF EQUIPPED)



1. selector lever	3. key inter lock cable
2. knob button	4. key cylinder

NOTE:

Don’t bend interlock cable excessively when removing and installing it, or system will not operate correctly.

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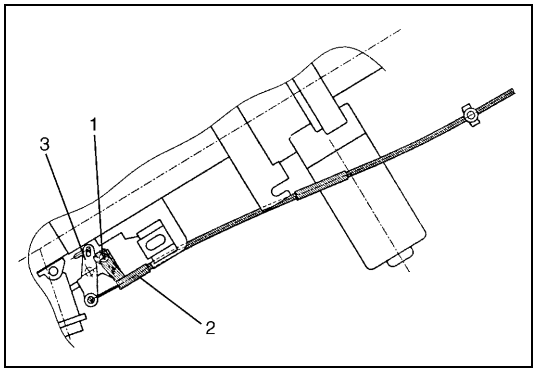
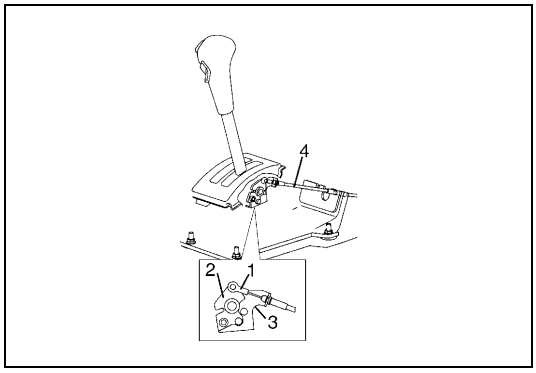
REMOVAL

1) Disconnect negative cable at battery and disable air bag system, referring to “DISABLING AIR BAG SYSTEMS” in Section 10B (if equipped).
2) Remove steering column hole cover and steering column cover.
3) Remove steering column mounting bolts and nuts.

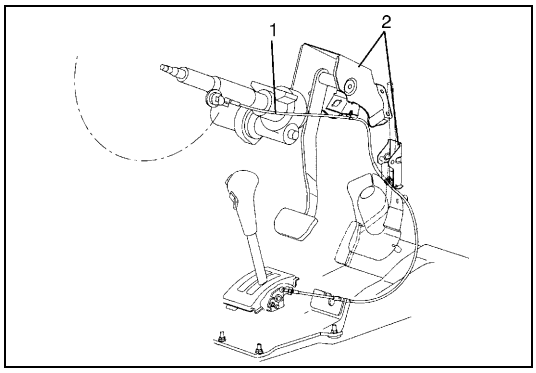


4) Remove interlock cable screw (1) located at ignition switch and disconnect interlock cable (2) from key cylinder arm (3) with ignition switch turned to “ACC” position.
5) Remove center console.

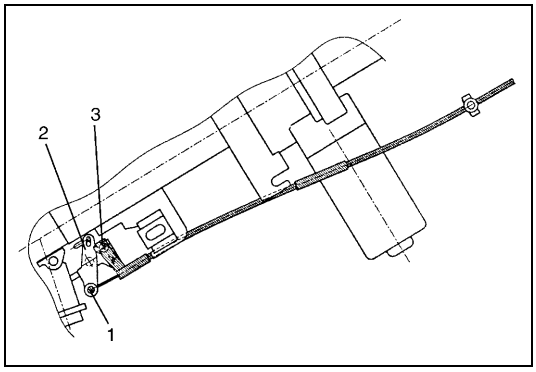


6) Remove cable end (1) from key interlock cam (2) and its bracket (3).
7) Remove interlock cable (4).

INSTALLATION



1) Install interlock cable (1) to pedal brackets (2) by clamp as shown in figure.



2) With ignition key at “ACC” position, connect cable end (1) to key cylinder arm (2) and tighten cable screw (3) securely.

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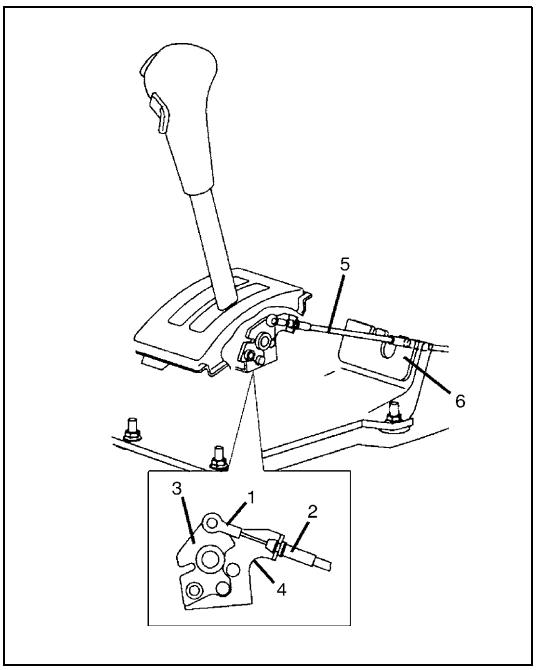
3) If selector lever is in “P” range, shift selector lever to other than “P” range with releasing shift lock referring to “SHIFT LOCK SOLENOID MANUAL RELEASE” in this section.



4) Install cable end (1) and cable casing cap (2) to key interlock cam (3) and its bracket (4), then install cable (5) to selector pad (6).

5) With selector lever set at “P” position, turn ignition key to “ACC” position and then check for following conditions.
   - With knob button released, ignition key can be turned from “ACC” position to “LOCK” position.
   - With knob button pressed, ignition key cannot be turned from “ACC” position to “LOCK” position.
6) Install steering column referring to Section 3C.
7) Install steering column hole cover.
8) Install center console.
9) Connect negative cable at battery and enable air bag system, referring to “ENABLING AIR BAG SYSTEM” in Section 10B (if equipped).

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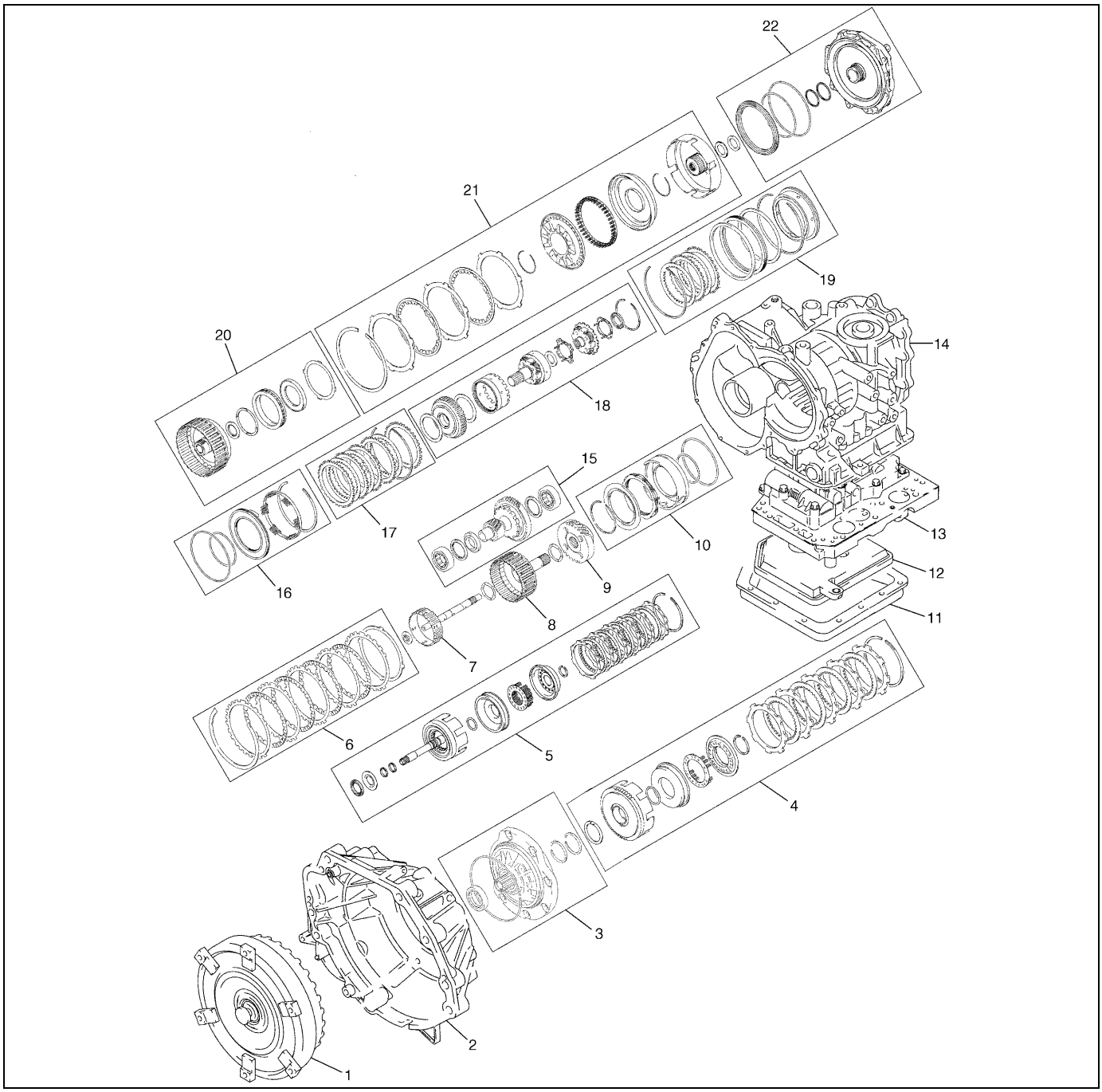
TRANSMISSION UNIT REPAIR OVERHAUL

NOTE:

When transmission is replaced, or when clutch or brake disc, plate and/or flange is changed to new and/or used one, all learned contents which are stored in TCM memory should be erased referring to "LEARNING CONTROL INITIALIZATION" in this section.



1. Torque converter	9. Counter drive gear	17. 1st & 2nd brake (B1) assembly
2. Torque converter housing	10. Reverse brake (B2) piston assembly	18. Planetary gear assembly
3. Oil pump assembly	11. A/T oil pan	19. O/D brake (B0) assembly
4. Front clutch (C2) assembly	12. Oil strainer	20. Planetary sun gear No.1 assembly
5. Rear Clutch (C1) assembly	13. Valve body assembly	21. Direct clutch (C0) assembly
6. Reverse brake (B2) assembly	14. Transmission case	22. O/D brake (B0) piston and rear cover assembly
7. Intermediate shaft	15. Counter driven gear assembly	
8. Follow shaft	16. 1st & 2nd brake (B1) piston assembly	

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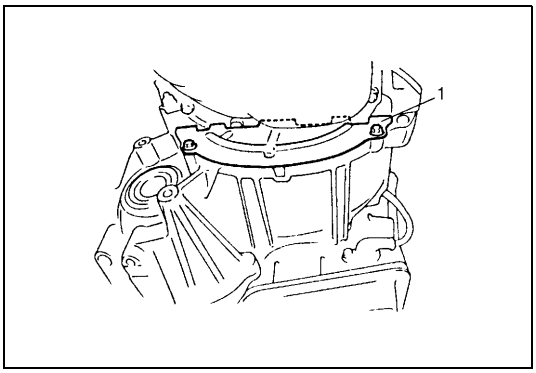
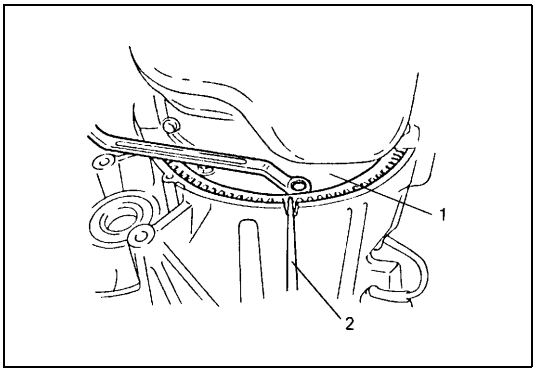
DISMOUNTING

1) Take down transmission with engine. For its procedure, refer to Section 6A1.
2) For 4WD vehicle, remove transfer referring to Section 7D
   For 2WD vehicle, remove engine rear mounting No.1 bracket and engine rear mounting No.2 bracket with stiffener.

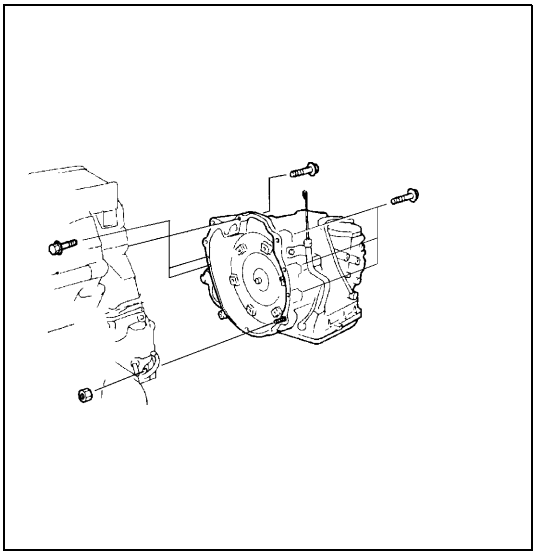


3) Remove torque converter housing lower plate (1).



4) Remove drive plate bolts.
   To lock drive plate (1), engage a flat head rod or the like (2) with drive plate gear.

5) Remove starting motor.



6) Remove bolts and nut fastening engine and transmission, then detach transmission from engine.

NOTE:

When detaching transmission from engine, move it in parallel with crankshaft and use care so as not to apply excessive force to drive plate and torque converter.

WARNING:

Be sure to keep transmission with torque converter horizontal or facing up throughout the work. Should it be tilted with torque converter down, converter may fall off and cause personal injury.

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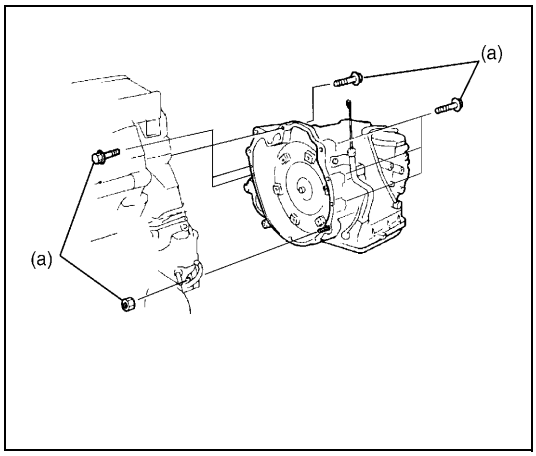
REMOUNTING

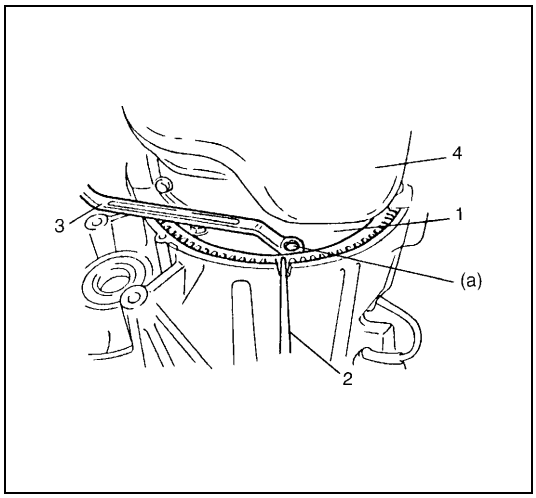
1) Make sure that torque converter is installed correctly to transmission.
   Refer to “UNIT ASSEMBLY” in this section.



2) Attach transmission to engine.

Tightening torque
Transmission to engine bolts and nut
(a) : 85 N·m (8.5 kg-m, 61.5 lb-ft)

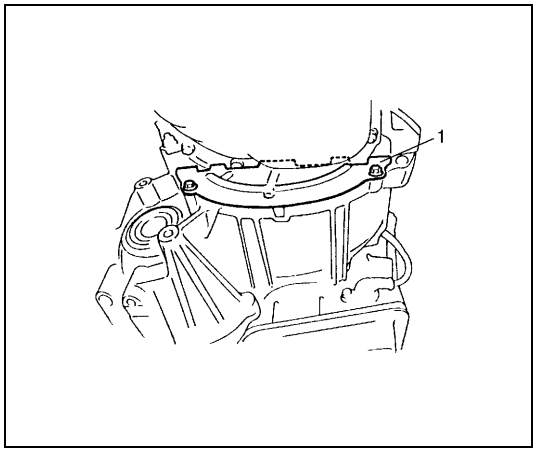
WARNING:
Be sure to keep transmission with torque converter horizontal or facing up throughout the work. Should it be tilted with torque converter down, converter may fall off and cause personal injury.



3) Tighten drive plate-torque converter bolts.
   Align drive plate bolt hole and torque converter through starter motor mounting opening then tighten bolts through torque converter housing lower plate opening.
   Lock drive plate (1) by engaging a flat head rod or the like (2) with drive plate gear.

Tightening torque
Drive plate to torque converter bolts
(a) : 20 N·m (2.0 kg-m, 14.5 lb-ft)

3.	Wrench
4.	Engine oil pan



4) Install torque converter housing lower plate (1).
5) Install starter motor.

Tightening Torque
Starter motor bolts : 23 N·m (2.3 kg-m, 16.5 lb-ft)

6) For 4WD vehicle, install transfer referring to Section 7D.
   For 2WD vehicle, install engine rear mounting brackets and stiffener.
7) Remount engine with transmission assembly to vehicle. Refer to Section 6A1 for its procedure.

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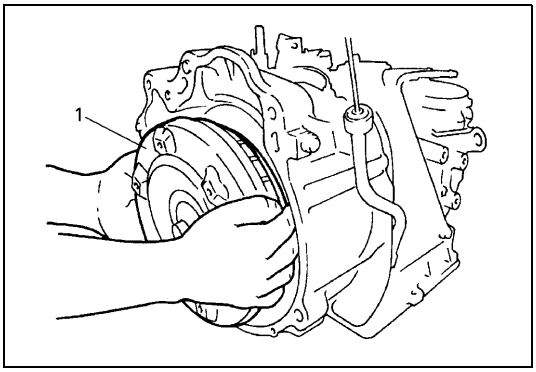
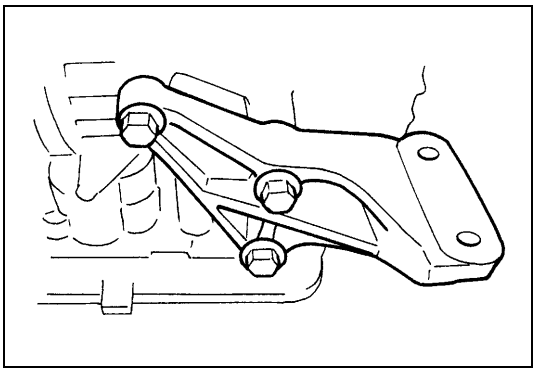
UNIT DISASSEMBLY

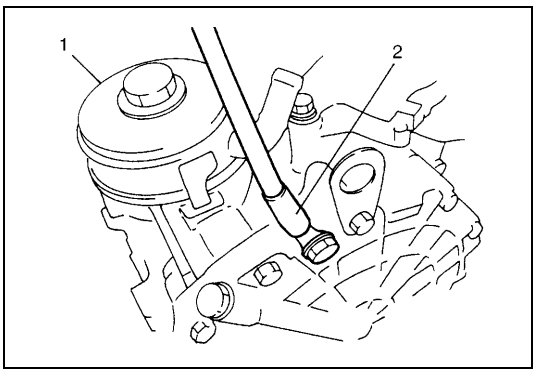
CAUTION:
- **Thoroughly clean transmission exterior before overhauling it.**
- **Keep working table, tools and hands clean while overhauling.**
- **Use special care to handle aluminum parts so as not to damage them.**
- **Do not expose removed parts to dust. Keep them always clean.**



1) Remove torque converter (1).



2) Remove engine mounting LH bracket.



3) Remove oil cooler (1) and battery ground cable (2) (if still attached).

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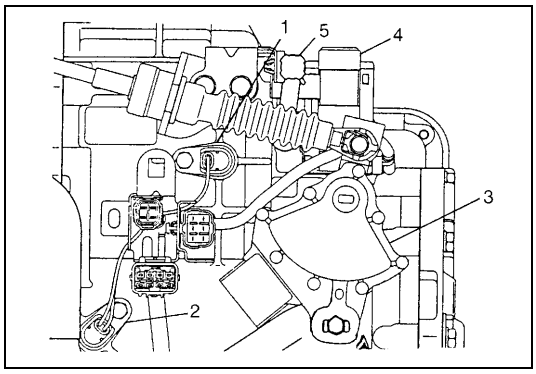
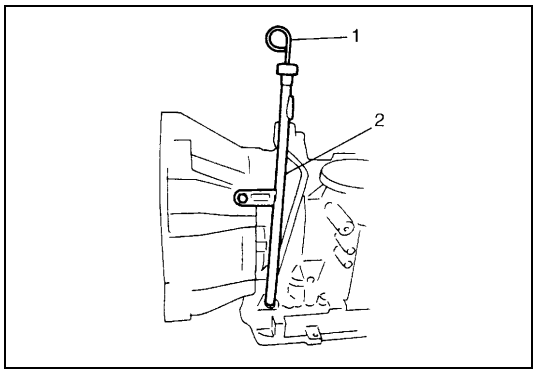
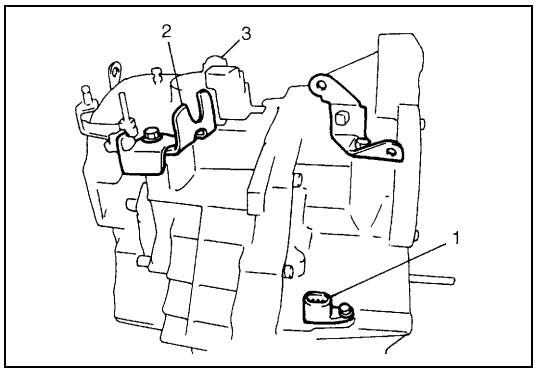


4) Remove output shaft speed sensor (1) and input shaft speed sensor (2).
5) Remove transmission range sensor (3).
6) Remove dropping resistor (4).
7) Remove breather hose (5).



8) Remove A/T fluid level gauge (1) and filler tube (2).

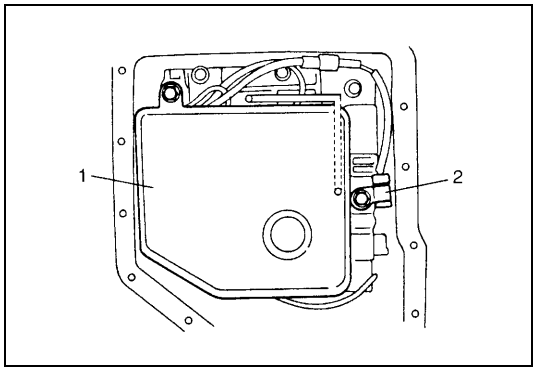


9) Remove vehicle speed sensor (1) (for speedometer), shift cable bracket (2) and connector clamp bracket (3).

10) Remove oil pan and oil pan gasket.

NOTE:

- **For removal of oil pan, do not turn transmission over as this will contaminate valve body with foreign materials in the bottom of oil pan.**
- **When removing oil pan, tap around it lightly with a plastic hammer. Do not force it off by using a screwdriver or the like.**



11) Remove oil strainer assembly (1), and detach transmission temperature sensor (2).

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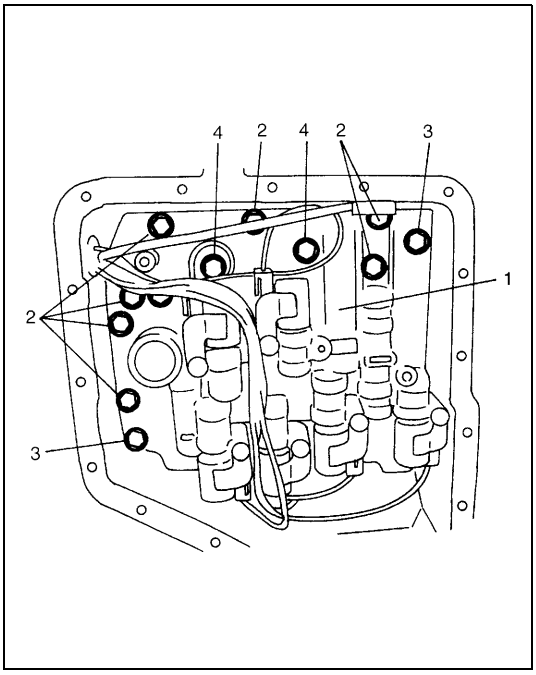


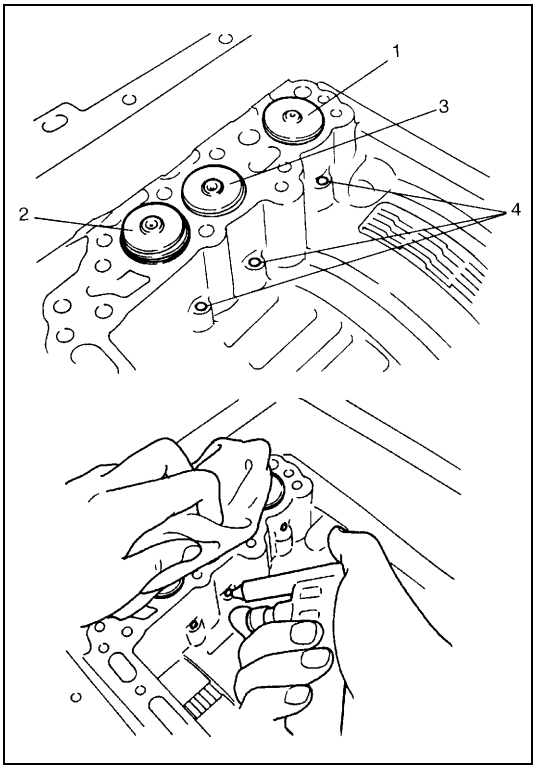
12) Disconnect couplers from solenoid valves, and transmission temperature sensor.
    Remove transmission temperature sensor.
13) Remove valve body assembly (1).

CAUTION:
Be careful not to let manual valve fall off when removing valve body assembly.

NOTE:
There are three kinds of bolts (bolts A, B and C) fixing valve body assembly.

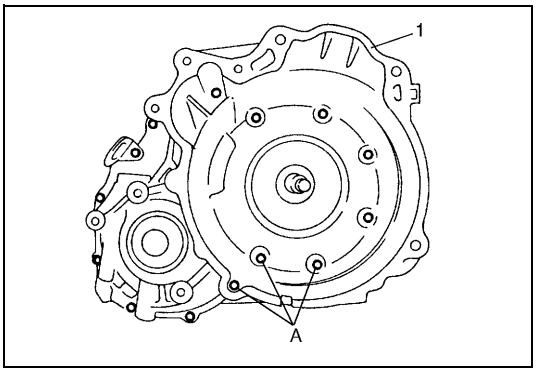
14) Remove solenoid harness assembly.

2. Bolt A
3. Bolt B
4. Bolt C



15) Remove accumulator pistons and springs.
    To remove C0 (1), C2 (2) and B1 (3) accumulator pistons and springs, position a rag on pistons to catch each piston. To remove pistons, force low-pressure compressed air (1 kg/cm^2, 15 psi, 100 kPa, max) into hole (4) as shown in figure, and pop each piston into the rag.
    To remove B0 and C1 accumulator pistons and springs, remove each snap ring and accumulator spacer, then remove spring and piston.

NOTE:
Do not push accumulator pistons with fingers or anything before removing them. Pushing them may cause compressed fluid in accumulator to spew out of hole and get to your face and clothes.



16) Remove torque converter housing (1).
    a) Remove housing bolts.
    b) Remove housing while tapping around it lightly with a plastic hammer.

NOTE:
Never reuse bolts A shown in figure.

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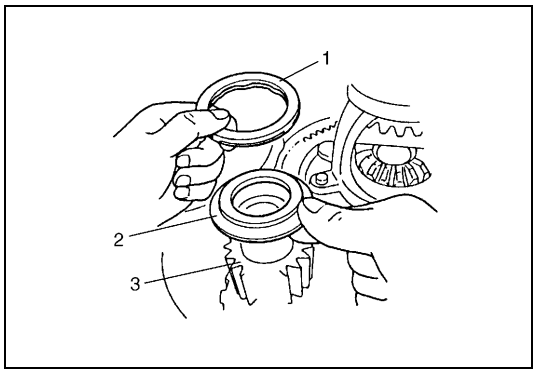
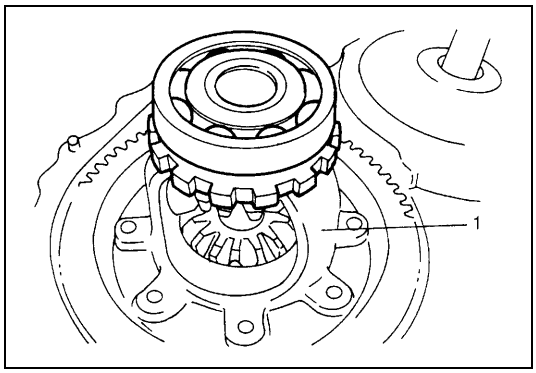
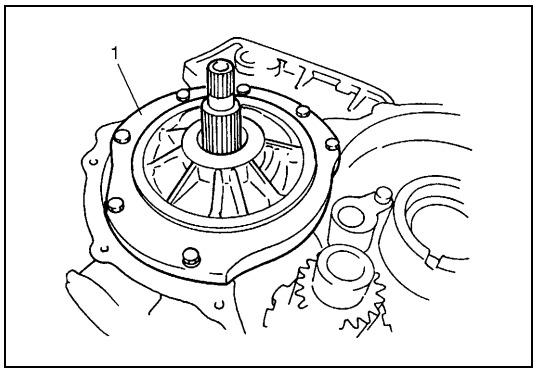


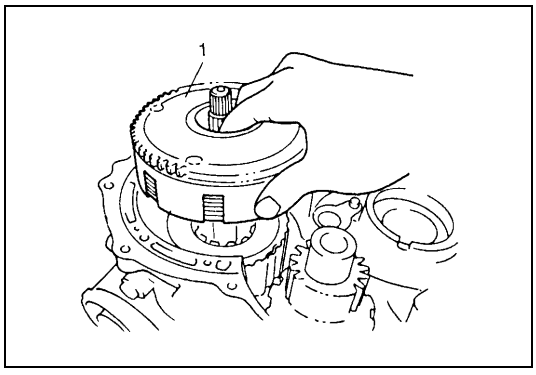
17) Remove thrust needle roller bearing (1) and thrust bearing race (2) from the top of counter driven gear assembly (3).



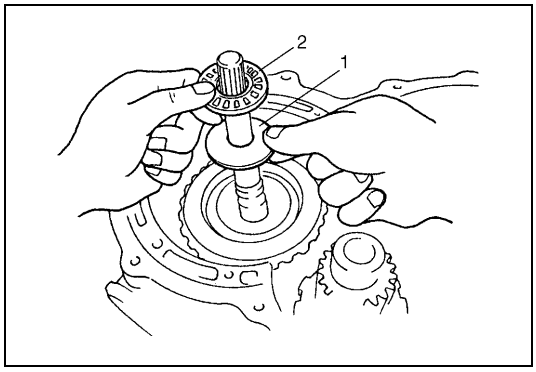
18) Remove differential gear assembly (1).



19) Remove oil pump assembly and gasket (1).



20) Remove front clutch assembly (1).



21) Remove thrust bearing race (1) and thrust needle roller bearing (2).

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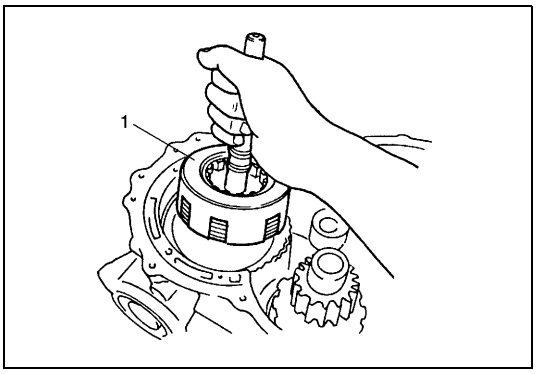
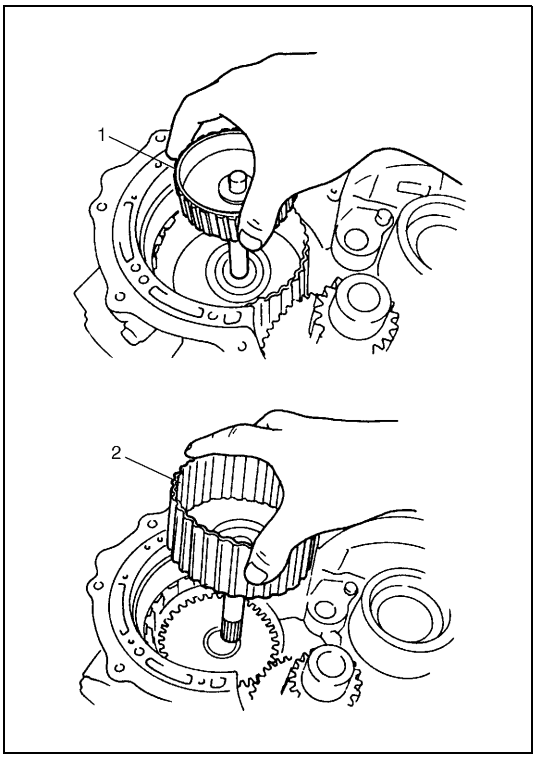
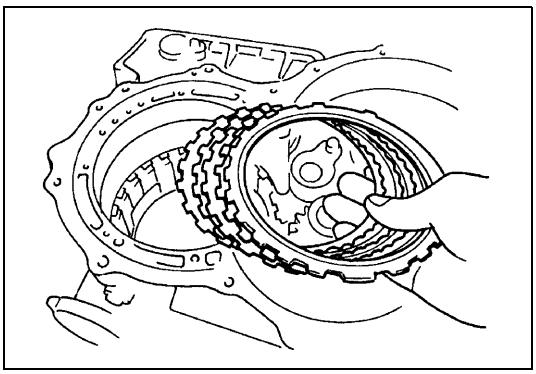


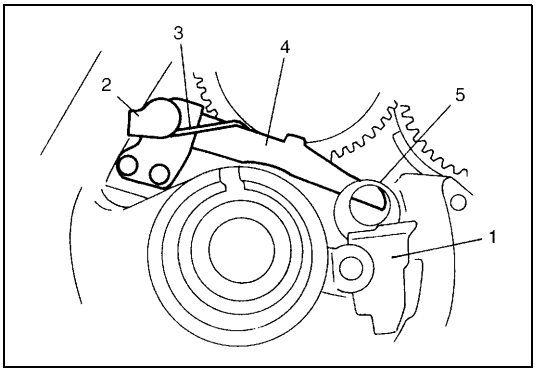
22) Remove rear clutch assembly (1).



23) Remove intermediate shaft assembly (1) and follow shaft assembly (2).



24) Remove reverse brake (B2) snap ring, brake flange, brake discs, brake plates and cushion plate.



25) Remove oil guide plate (1) parking lock pawl cover (2), shaft, torsional spring (3) and parking lock pawl (4).
26) Remove parking lock pawl sleeve (5).

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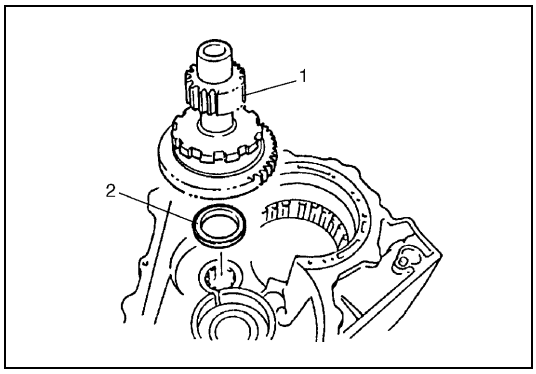
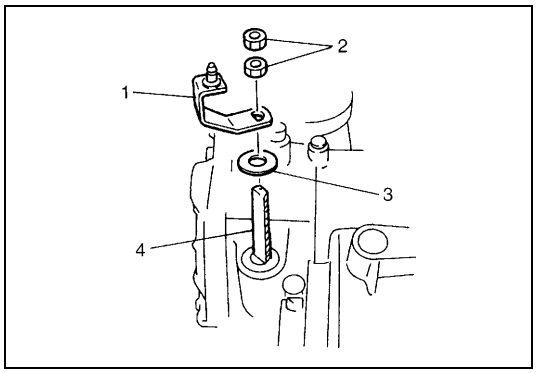
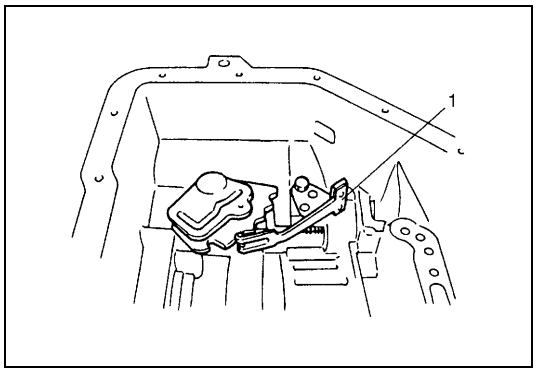


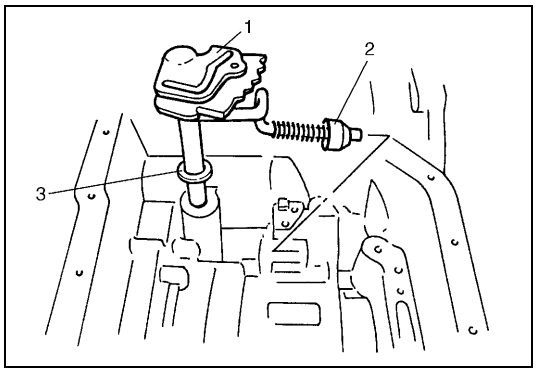
27) Remove counter driven gear assembly (1) and thrust needle roller bearing (2).



28) Remove control shift lever (1), nuts (2), washer (3) from manual shift shaft (4).



29) Remove detent spring (1).



30) Remove manual shift shaft (1) with parking lock rod (2), and washer (3) from transmission case.

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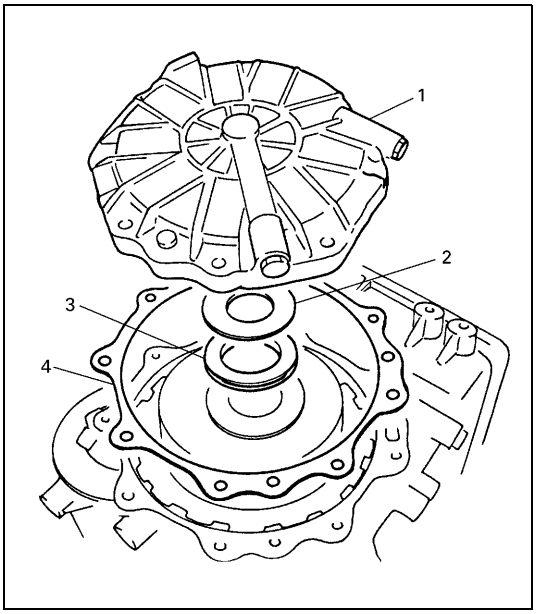
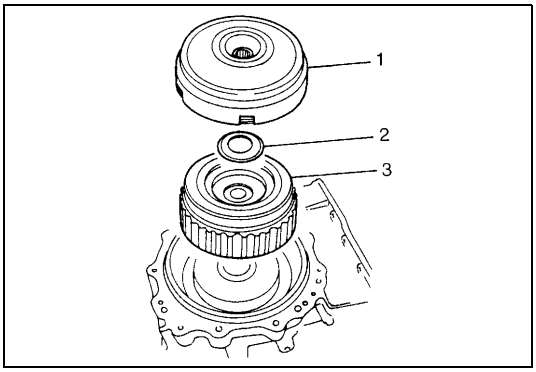
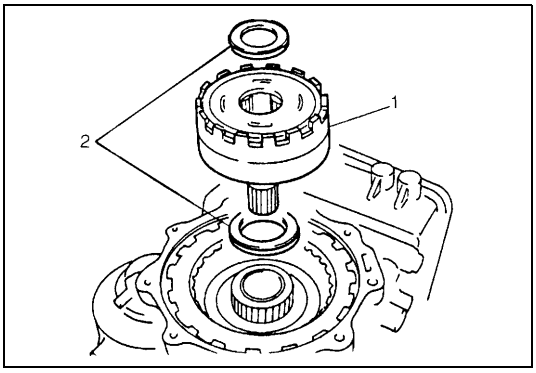


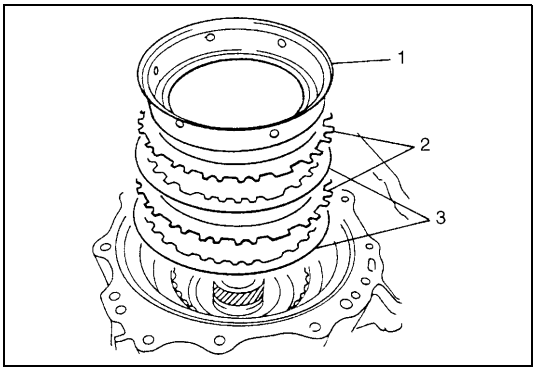
31) Remove rear cover assembly (1), thrust washer (2) and thrust needle roller bearing (3).
Remove gasket (4).



32) Remove direct clutch (C0) assembly (1), thrust roller bearing (2) and rear planetary sun gear No.1 assembly (3).



33) Remove planetary set (1) with bearing, thrust needle roller bearing (2).



34) Remove O/D brake (B0) piston adapter (1), B0 plates (2) and discs (3).

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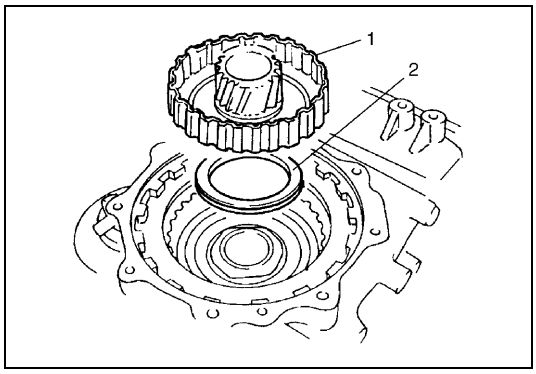
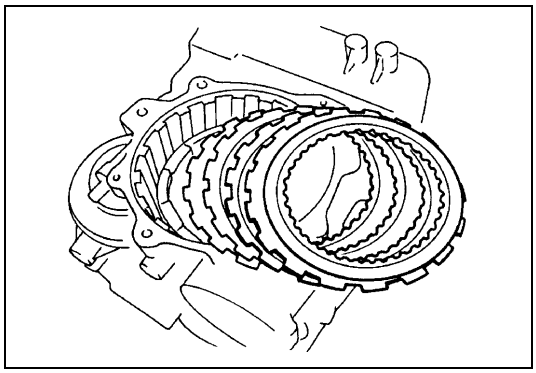
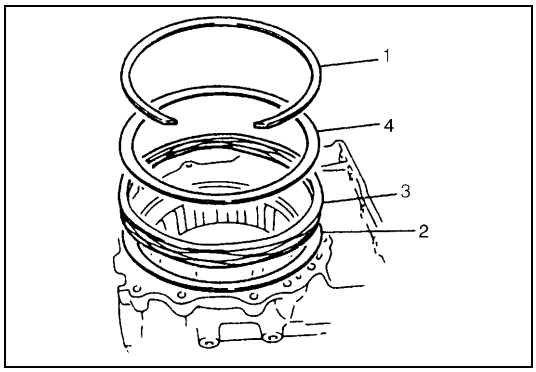


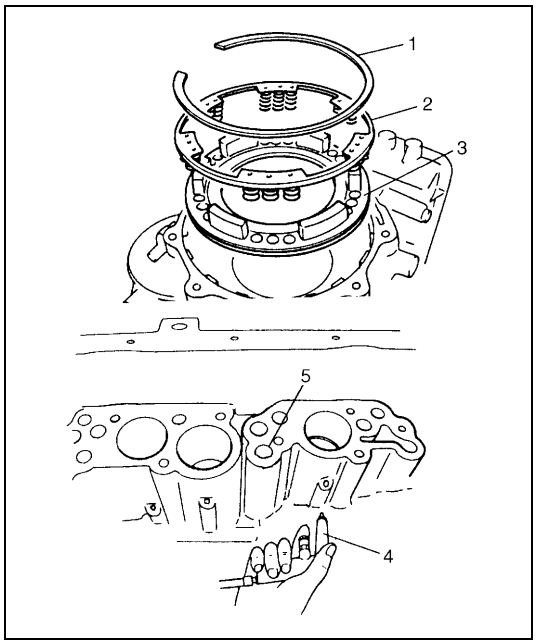
35) Remove planetary sun gear No.2 (1) and thrust needle roller bearing (2).



36) Remove snap ring, then remove brake flange and disc.
37) Remove snap ring, then remove brake discs and plates (B1 brake).



38) Remove snap ring (1), then O/D brake return spring seat (2), return spring (3) and spring retainer (4).



39) Remove snap ring (1) then remove 1st & 2nd brake piston return spring subassembly (2) and 1st & 2nd brake piston (3).
To remove 1st & 2nd brake piston, force low-pressure compressed air (1 kg/cm^2, 15 psi, 100 kPa, max) into hole (5) shown in figure and pop out 1st & 2nd brake piston into a rag.

4. Air gun

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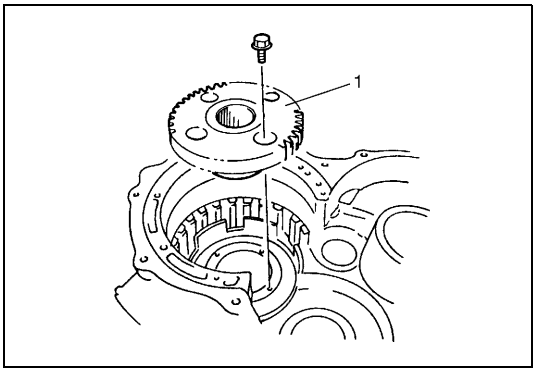
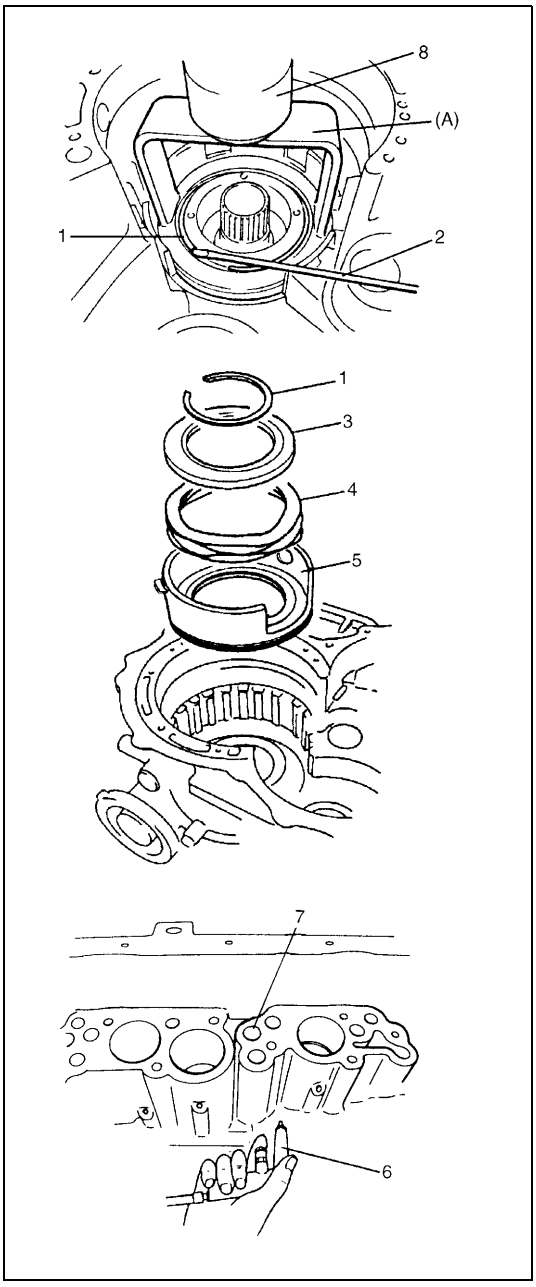


40) Remove counter drive gear (1).



41) Use hydraulic press (8) and special tool to compress wave spring (4), then remove snap ring (1).

Special tool
(A) : 09926-96040

NOTE:

- **Do not compress wave spring more than necessary.**
- **Do not reuse snap ring (1).**

42) Remove reverse brake piston seat (3), wave spring (4) and reverse brake piston (5).
To remove reverse brake piston, force low-pressure compress air (1 kg/cm^2, 15 psi, 100 kPa, max) into hole (7) shown in figure, and pop out piston into a rag.

2. Flat end rod or the like
6. Air gun

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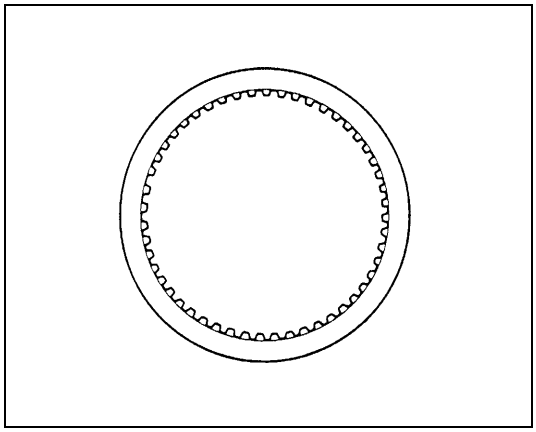
INSPECTION

Clutch and Brake Discs

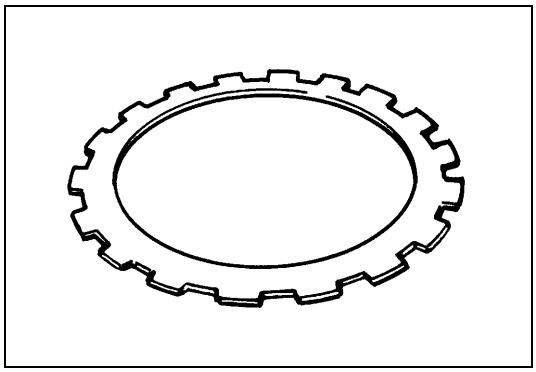


Dry and inspect them for pitting, burn flaking, wear, glazing, cracking, charring and chips or metal particles imbedded in lining. If discs show any of the above conditions, replacement is required.

NOTE:

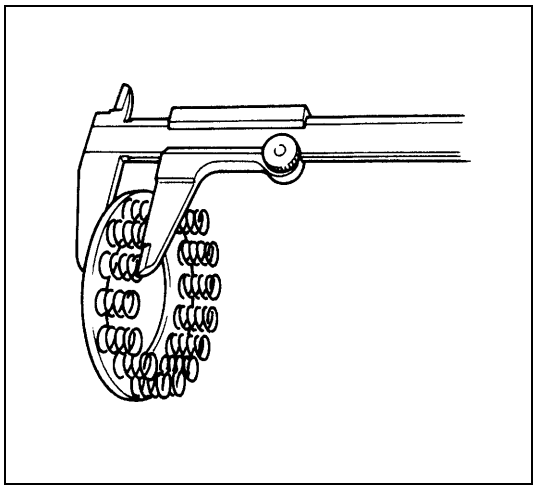
- **If disc lining is exfoliated or discolored, replace all discs.**
- **Before assembling new discs, soak them in A/T fluid for at least two hours.**

Clutch and Brake Plates and Flanges



Dry plates and check for discoloration. If plate surface is smooth and even color smear is indicated, the plate should be reused. If severe heat spot discoloration or surface scuffing is indicated, the plate must be replaced.

1st & 2nd Brake Piston Return Spring Subassembly



Measure height of 1st & 2nd brake piston return spring.

Height of 1st & 2nd brake piston return spring
20.81 mm (0.819 in.)

NOTE:

- **Do not apply excessive force when measuring spring height.**
- **Perform measurement at several points.**

Evidence of extreme heat or burning in the area of clutch may have caused springs to take a heat set and would require their replacement.

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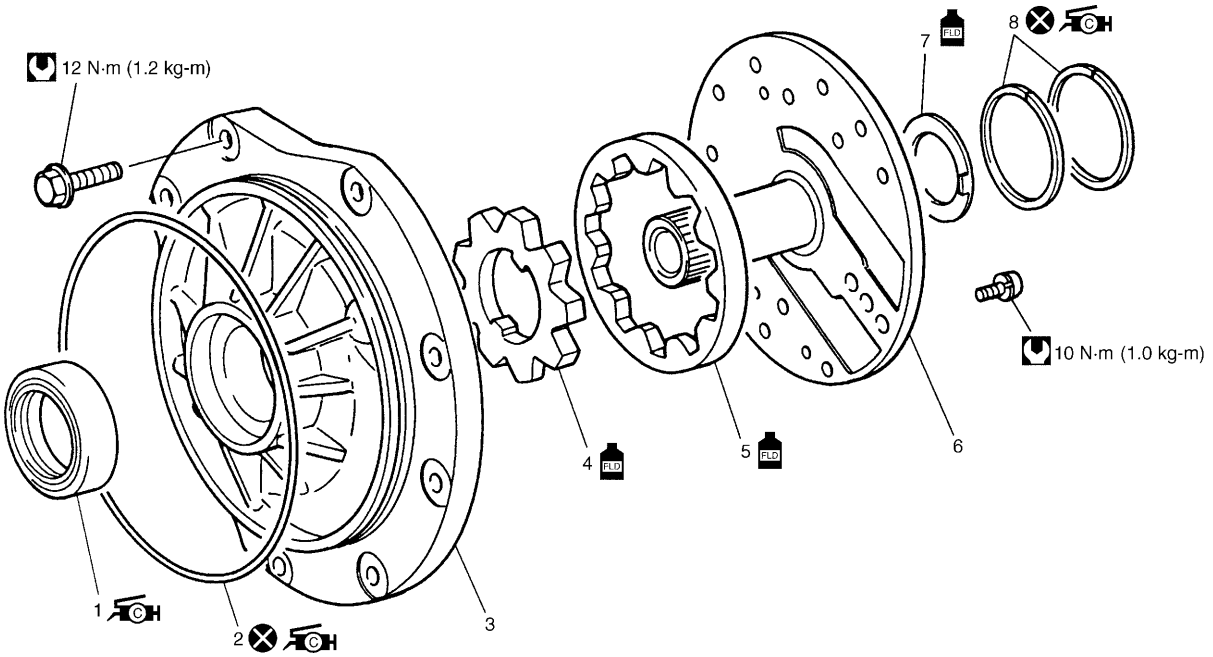
DISASSEMBLY/ASSEMBLY OF SUBASSEMBLY

CAUTION:

- **Keep component parts in group for each subassembly and avoid mixing them up.**
- **Clean all parts with cleaning solvent thoroughly and air dry them.**
- **Use kerosene or automatic transmission fluid as cleaning solvent.**
- **Do not use wiping cloths or rags to clean or dry parts.**
- **All oil passages should be blown out and checked to make sure that they are not obstructed.**
- **Keep face and eyes away from solvent spray while air blowing parts.**
- **Check mating surface for irregularities and remove them, if any, and clean it again.**
- **Soak new clutch discs and brake discs in transmission fluid for at least 2 hours before assembly.**
- **Replace all gaskets and O-rings with new ones.**
- **Apply automatic transmission fluid to all O-rings.**
- **When installing seal ring, be careful so that it is not expanded excessively, extruded or caught.**
- **Replace oil seals that are removed and apply grease to their lips.**
- **Before installing, be sure to apply automatic transmission fluid to sliding, rolling and thrusting surface of all component part. Also after installation, make sure to check each part for proper operation.**
- **Always use torque wrench when tightening bolts.**

OIL PUMP



C	1. Oil seal : Apply grease 99000-25030 to oil seal lip.		7. Clutch drum thrust washer
C	2. D-ring : Apply grease 99000-25030 to all over surface.	C	8. Clutch drum oil seal ring : Apply grease 99000-25030 to all over surface.
	3. Oil pump body	FLD	Apply automatic transmission fluid.
	4. Oil pump drive gear		Tightening torque
	5. Oil pump driven gear		Do not reuse.
	6. Stator shaft assembly		

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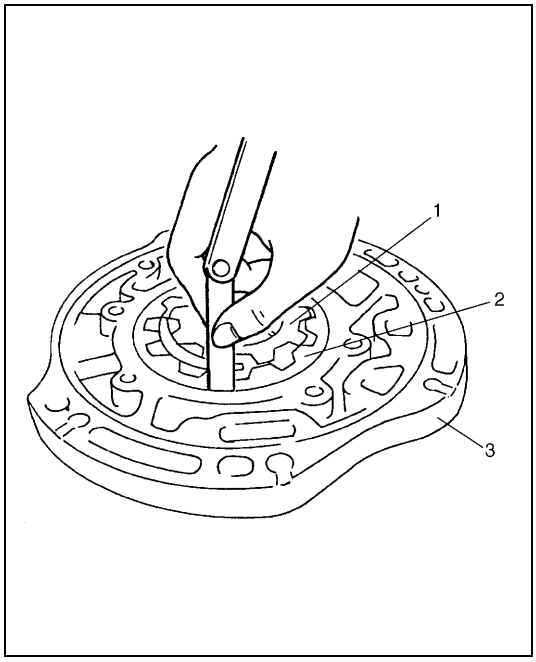
DISASSEMBLY

1) Remove D-ring from pump body.
2) Remove 2 oil seal rings and clutch drum thrust washer.
3) Remove 11 bolts.
4) Separate pump body from stator shaft assembly.
5) Remove oil seal from pump body.

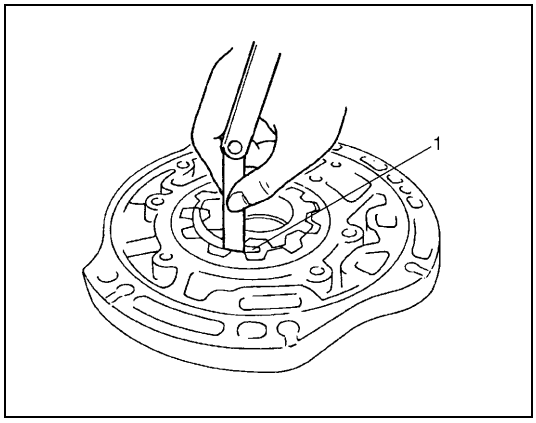
INSPECTION



1) Inspect pump body oil seal.
   Check for wear, damage or cracks.
   Replace oil seal if necessary and apply grease to its lip portion slightly when it is installed.
2) Check body clearance of driven gear.
   Push driven gear to one side of body. Using a feeler gauge, measure clearance between driven gear and body.
   If clearance exceeds its standard value, replace oil pump assembly.

Clearance between oil pump driven gear and oil pump body
Standard : 0.08 – 0.15 mm (0.0027 – 0.0059 in.)
Limit : 0.30 mm (0.018 in.)

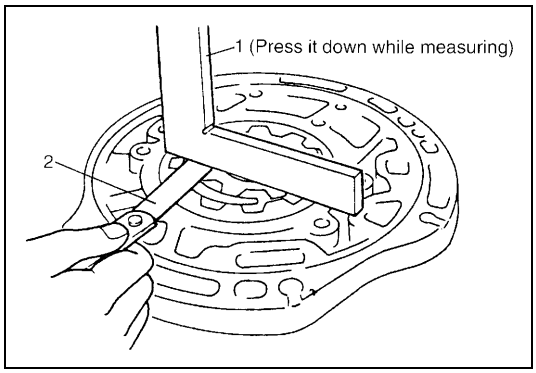
1.	Oil pump drive gear
2.	Driven gear
3.	Body



3) Check tip clearance of both drive and driven gears.
   Measure radial clearance between gear tooth and crescent.
   If clearance exceeds its standard value, replace oil pump assembly.

Radial clearance between oil pump gear tooth and oil pump crescent
Standard : 0.13 – 0.20 mm (0.0051 – 0.0079 in.)
Limit : 0.30 mm (0.018 in.)

1.	Pump body crescent portion



4) Check side clearance of both gears.
   Using a straightedge (1) and a feeler gauge (2), measure side clearance between gear and pump body.
   If clearance exceeds its standard value, replace oil pump assembly.

Side clearance between gear and oil pump body
Standard : 0.02 – 0.04 mm (0.0008 – 0.0015 in.)

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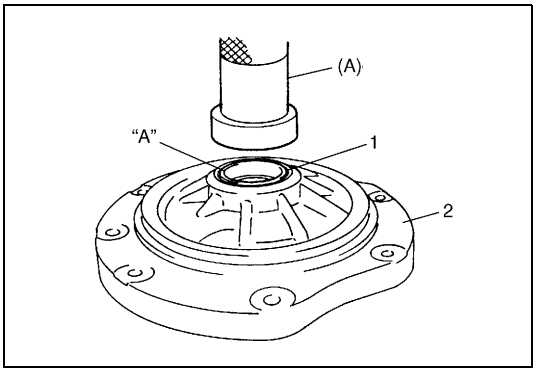
ASSEMBLY

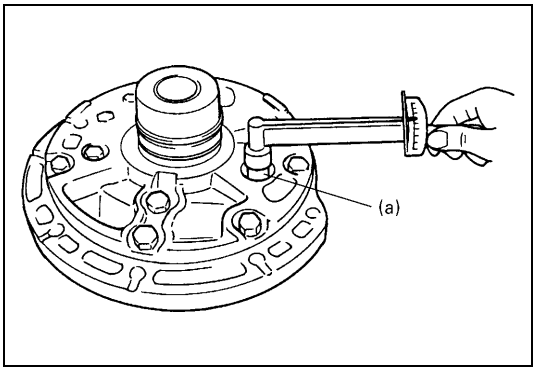


1) Install pump body oil seal (1)
   Use special tool and hammer to install it, and then apply grease to its lip portion.

   Special tool
   (A) : 09913-85210

   "A": Grease 99000-25030

2) Install driven gear and drive gear to pump body (2) after applying A/T fluid to gears.



3) Install stator shaft assembly to pump body and tighten 11 pump cover bolts to specification.

   Tightening torque
   Oil pump cover bolts (a) : 10 N·m (1.0 kg-m, 7.5 lb-ft)

4) Install 2 new oil seal rings to stator shaft.
5) Apply grease to 2 oil seal rings.
6) Install new D-ring to which grease is applied and make sure that it is not twisted or extruded.
7) Check drive gear for smooth rotation.

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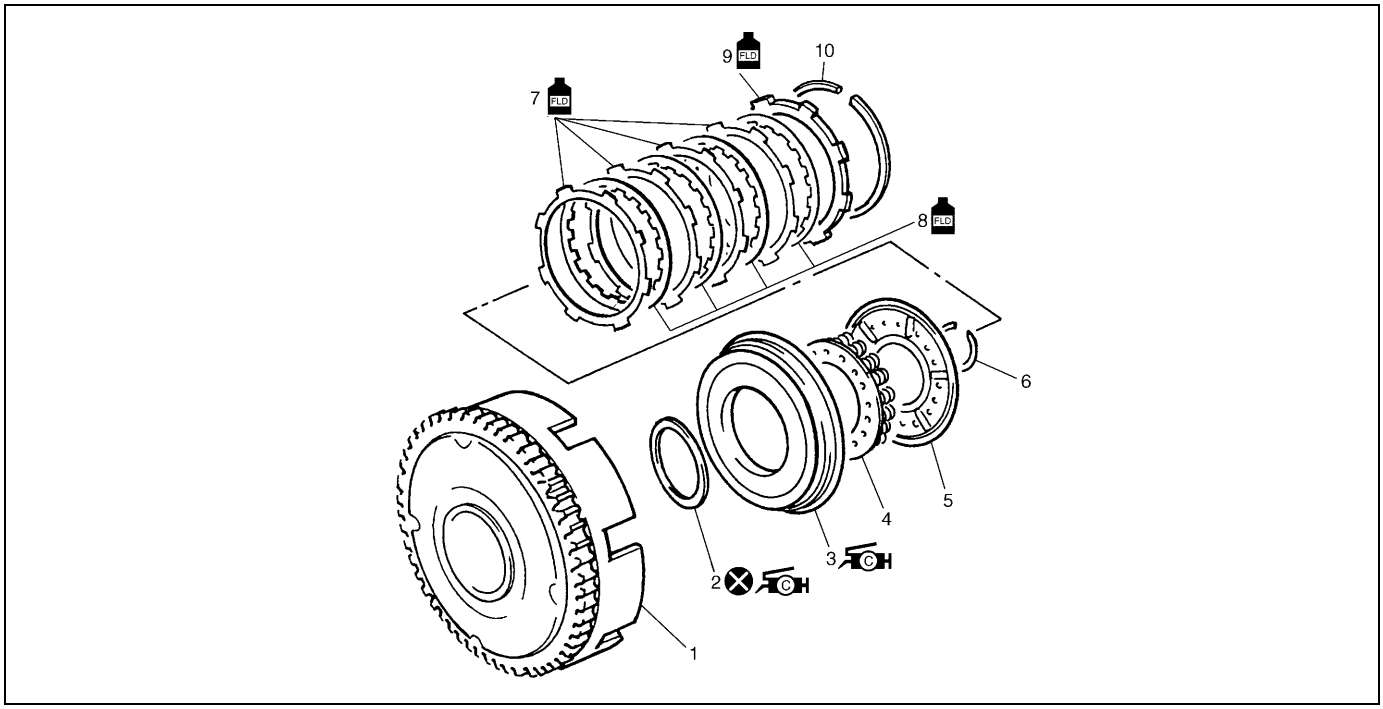
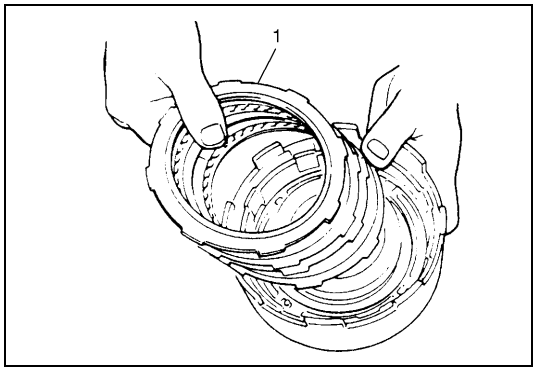
FRONT CLUTCH (C2 CLUTCH)

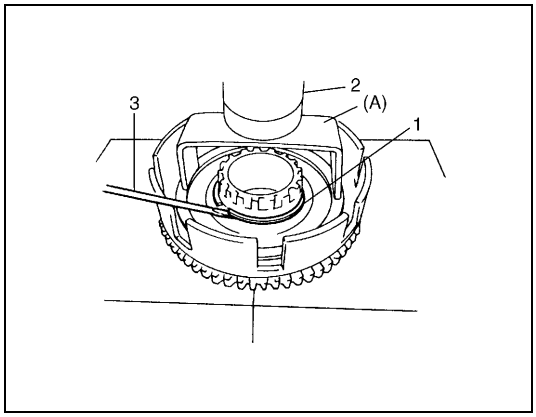


	1. Front clutch No.1 drum	7. Clutch plate
C	2. D-ring : Apply grease 99000-25030 to all over surface.	8. Clutch disc
C	3. Front clutch piston : Apply grease 99000-25030 to the lip of the piston.	9. Clutch flange
	4. Front clutch return spring seat	10. Snap ring
	5. Front clutch balancer	FLD Apply automatic transmission fluid.
	6. Shaft snap ring	Do not reuse.

DISASSEMBLY



1) Remove snap ring.
2) Remove flange (1), discs and plates.



3) Remove shaft snap ring (1).
   Compress piston return springs and remove shaft snap ring. Place special tool (clutch spring compressor) on spring seat and compress spring with a press (2), and then remove shaft snap ring, using a flat end rod or the like (3).

CAUTION:
Do not push down return spring more than necessary.

Special tool
(A) : 09926-96010

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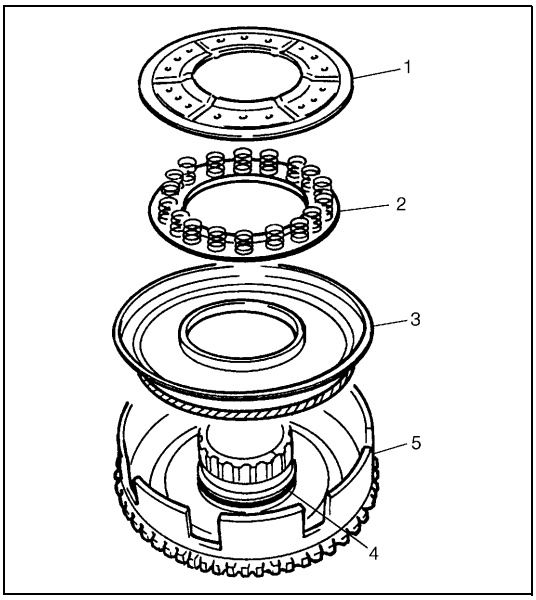
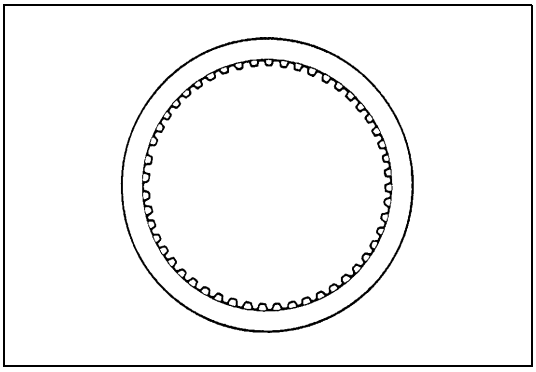


4) Remove front clutch balancer (1) and front clutch return spring seat (2).
5) Remove front clutch piston (3).
   Blow compressed air through input shaft oil hole to remove piston. If piston does not pop out, take it out with long nose pliers.
6) Remove D-ring (4) from front clutch No.1 drum (5).

INSPECTION

Clutch Discs, Plates and Flange

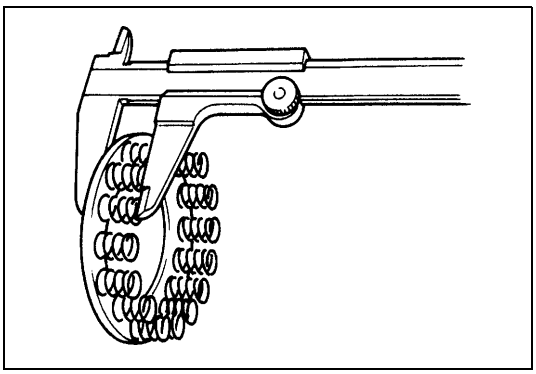


Check that sliding surfaces of discs, plates and flanges are not worn or burnt. If necessary, replace.

NOTE:

- **If disc lining is exfoliated or discolored, replace all discs.**
- **Before assembling new discs, soak them in A/T fluid for at least two hours.**

Front Clutch Return Spring Seat



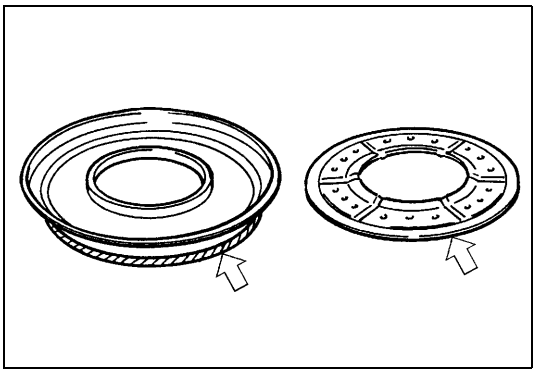
Measure height of front clutch return spring.

Height of front clutch return spring
: 14.85 mm (0.585 in.)

NOTE:

- **Do not apply excessive force when measuring spring height.**
- **Perform measurement at several points.**

Front Clutch Piston Lip and Front Clutch Balancer Lip



Check each lip for wear, deformation, cut, and/or hardening. If necessary, replace.

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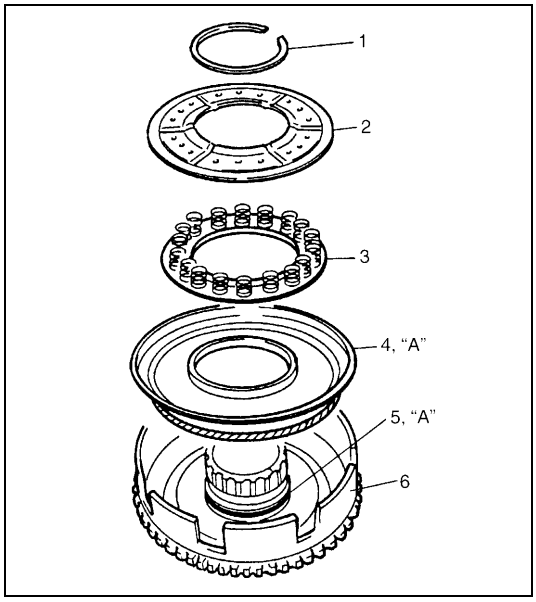
ASSEMBLY



1) Install new D-ring (5) to front clutch No.1 drum.
   Apply grease to D-ring and fit it to drum.

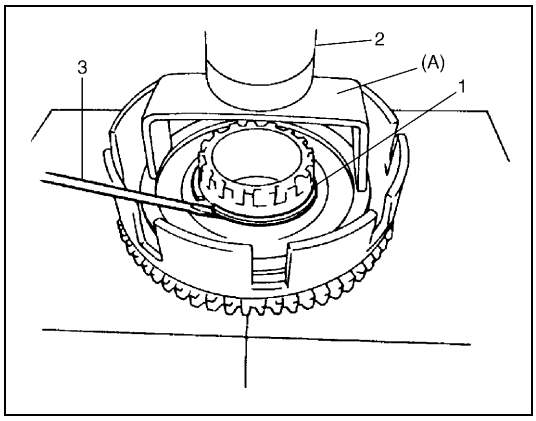
"A" : Grease 99000-25030

2) Install piston (4) into front clutch No.1 drum (6).
   Use care that the piston lip does not get twisted or caught.
   Apply grease to the lip of the piston.

"A" : Grease 99000-25030

3) Install front clutch return spring (3) seat and front clutch balancer (2).

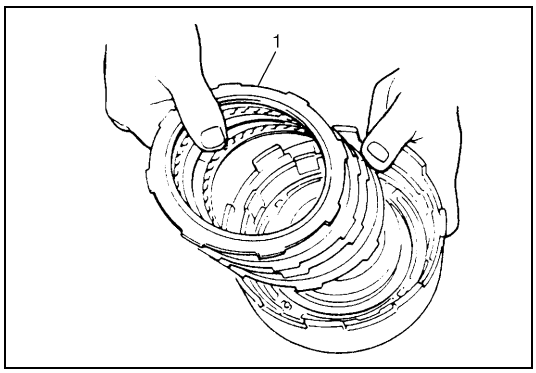
1. Snap ring



4) Install shaft snap ring (1).
   Compress return springs and install shaft snap ring in groove by using a flat end rod or the like (3).
   Place special tool (clutch spring compressor) on spring seat and compress springs with a press (2).

CAUTION:
Do not compress return spring more than necessary.

Special tool
(A) : 09926-96010



5) Install discs, plates and flange (1) in following order.
   (1) Plate → (2) Disc → (3) Plate → (4) Disc → (5) Plate → (6) Disc → (7) Plate → (8) Disc → (9) Flange

NOTE:

Before assembly, new discs should be soaked in automatic transmission fluid for at least 2 hours.

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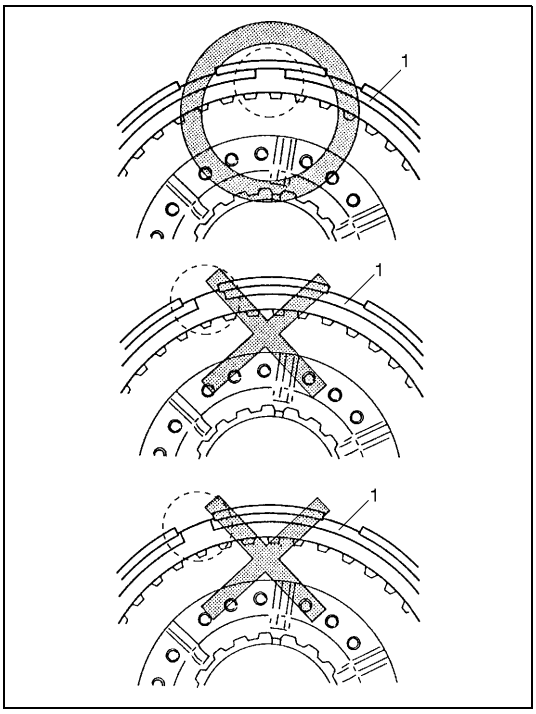
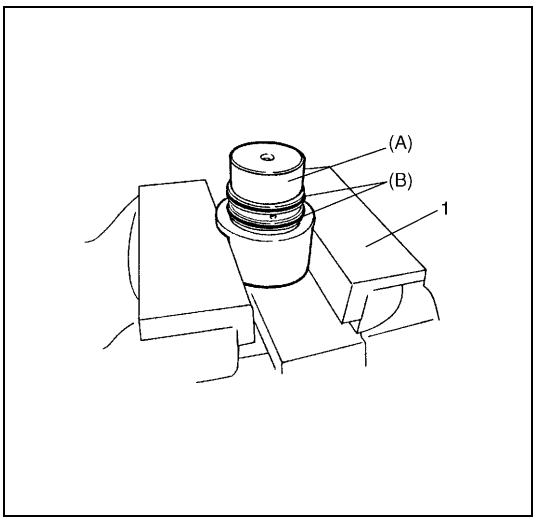


6) Install snap ring (1).

NOTE:

Make sure that the ends of the snap ring do not come to the opening of the front clutch No.1 drum.

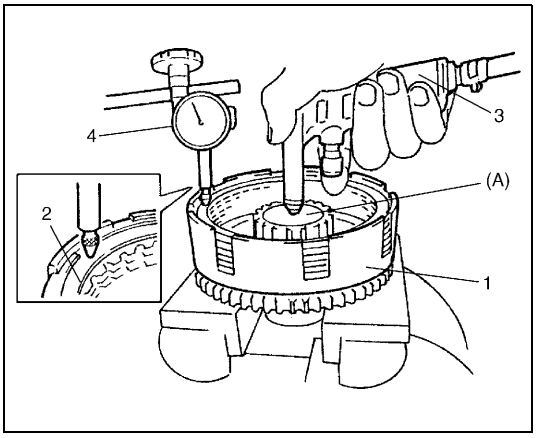


7) Place special tool (A) on soft jawed vise (1) and install 2 oil seal rings on special tool.

Special tool
(A) : 09926-26030
(B) : Clutch drum seal ring 22831-83E10 SUZUKI GENUINE PARTS

NOTE:

- **Clutch drum seal set has two seal rings in a set.**
- **Do not use the seal rings removed from oil pump assembly. It is not necessary to remove seal rings from special tool once installed.**



8) Place front clutch assembly (1) on special tool (A).
9) Set dial gauge (4) on the top of clutch flange (2) and measure clearance by blowing compressed air (4 kg/cm^2, 57 psi) as shown in figure.
If the clearance is out of specification, replace clutch discs, plates and flange.

Front clutch disc clearance
: 0.47 – 1.14 mm (0.0185 – 0.0448 in.)

3. Air gun

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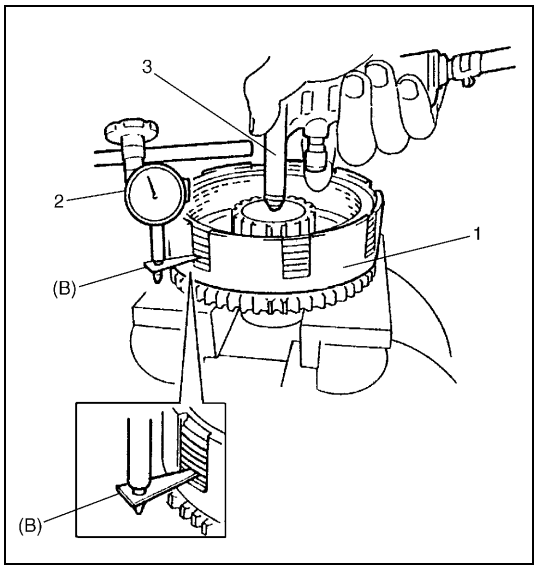


10) Attach special tool (B) to dial gauge (2) and set them on the lowest clutch plate.

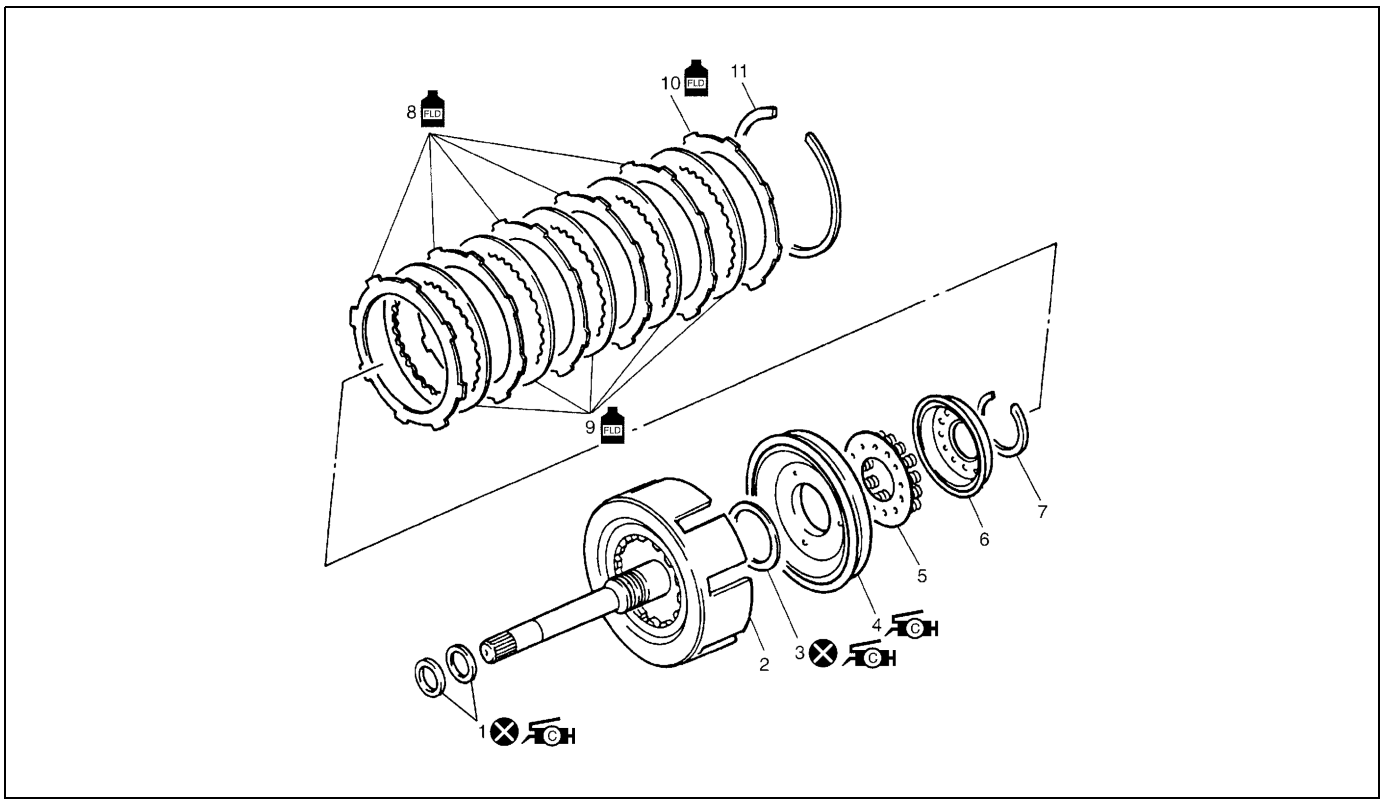
Special tool
(B) : 09952-06010

11) Measure piston stroke by blowing compressed air (4 kg/cm^2, 57 psi) as shown in figure.
If the piston stroke is out of specification, replace clutch discs, plates and flange.

Front clutch piston stroke
: 1.46 – 1.64 mm (0.0575 – 0.0646 in.)

1.	Front clutch assembly
3.	Air gun

REAR CLUTCH (C1 CLUTCH)



C	1.	Input shaft oil seal ring : Apply grease 99000-25030 to all over surface.	8. Clutch plate
	2.	Input shaft subassembly	9. Clutch disc
C	3.	D-ring : Apply grease 99000-25030 to all over surface.	10. Clutch flange
C	4.	Rear clutch piston : Apply grease 99000-25030 to the lip of the piston.	11. Snap ring
	5.	Rear clutch return spring seat	FLD Apply automatic transmission fluid.
	6.	Rear clutch balancer	⊗ Do not reuse.
	7.	Shaft snap ring	

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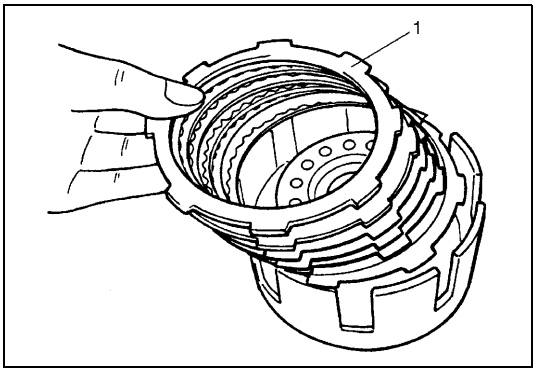
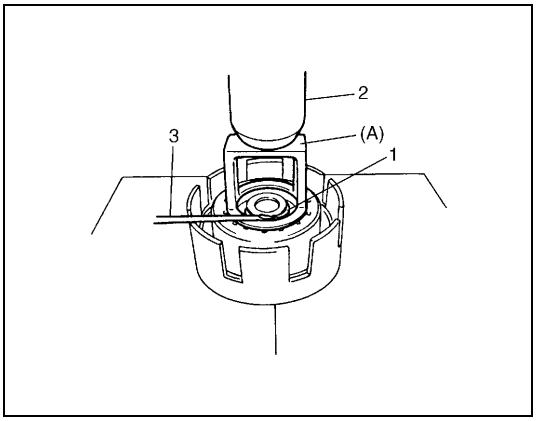
DISASSEMBLY



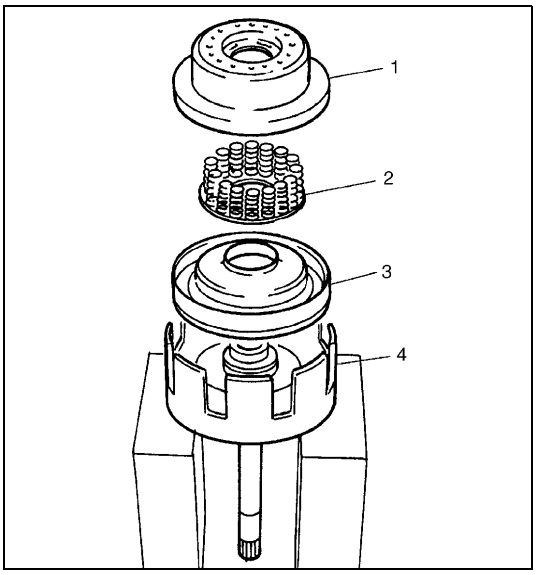
1) Remove snap ring.
2) Remove flange (1), discs and plates.



3) Remove shaft snap ring (1).
   Compress piston return springs and remove shaft snap ring. Place special tool (clutch spring compressor) on spring seat and compress spring with a press (2), and then remove shaft snap ring, using a flat end rod or the like (3).

CAUTION:
Do not push down return spring more than necessary.

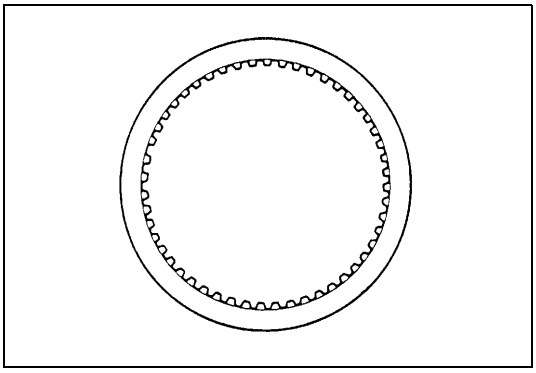
Special tool
(A) : 09926-96020



4) Remove rear clutch balancer (1) and rear clutch return spring seat (2).
5) Remove rear clutch piston (3).
   If piston does not pop out, blow compressed air through input shaft oil hole to remove piston.
6) Remove D-ring, and oil seals from input shaft subassembly (4).

INSPECTION

Clutch Discs, Plates and Flange



Check that sliding surfaces of discs, plates and flanges are not worn or burnt. If necessary, replace.

NOTE:

- **If disc lining is exfoliated or discolored, replace all discs.**
- **Before assembling new discs, soak them in A/T fluid for at least two hours.**

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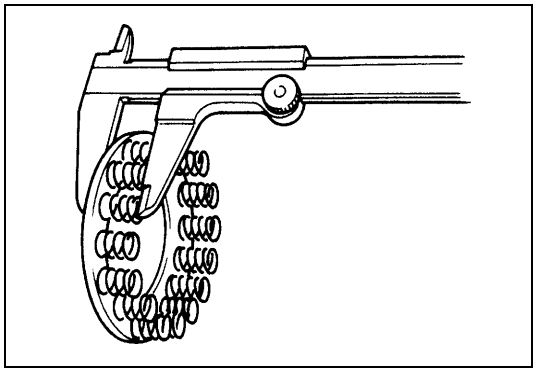
Rear Clutch Return Spring Seat



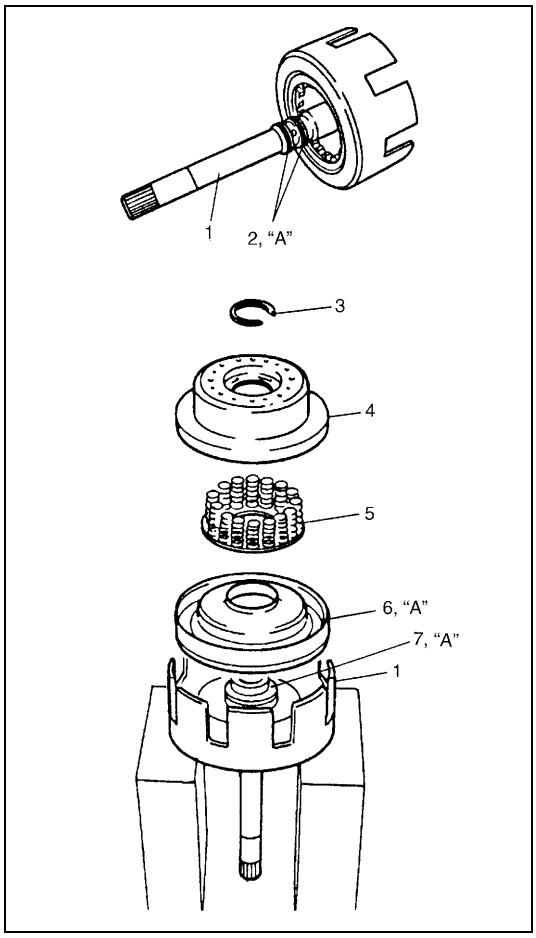
Measure height of overdrive clutch return spring.

Height of overdrive clutch return spring
: 22.01 mm (0.867 in.)

NOTE:

- **Do not apply excessive force when measuring spring height.**
- **Perform measurement at several points.**

ASSEMBLY



1) Install new D-ring (7) and oil seals (2) to input shaft subassembly. Apply grease to D-ring and fit it to input shaft subassembly (1).

"A" : Grease 99000-25030

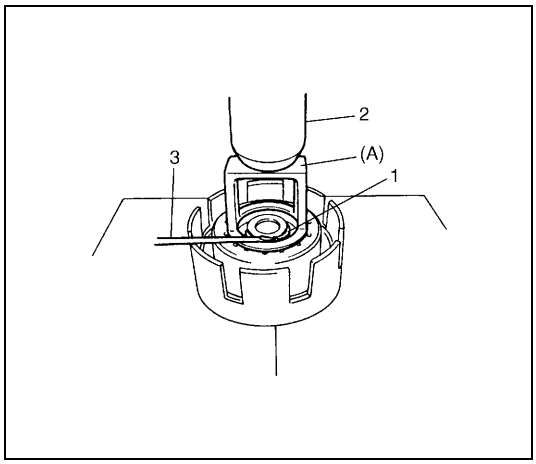
2) Install piston (6) into input shaft subassembly.
Apply grease to the lip of the piston.

"A" : Grease 99000-25030

Use care that the lip does not get twisted or caught.

3) Install rear clutch return spring seat (5) and rear clutch balancer (4).

3. Snap ring



4) Install shaft snap ring (1).
Compress return springs and install shaft snap rings in groove by using a flat end rod or the like (3).
Place special tool (clutch spring compressor) on spring seat and compress springs with a press (2).

CAUTION:
Do not compress return spring more than necessary.

Special tool
(A) : 09926-96020

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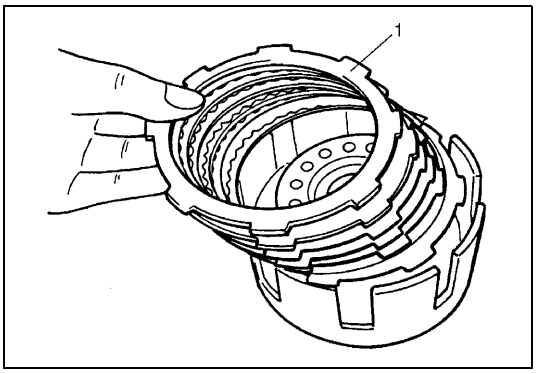
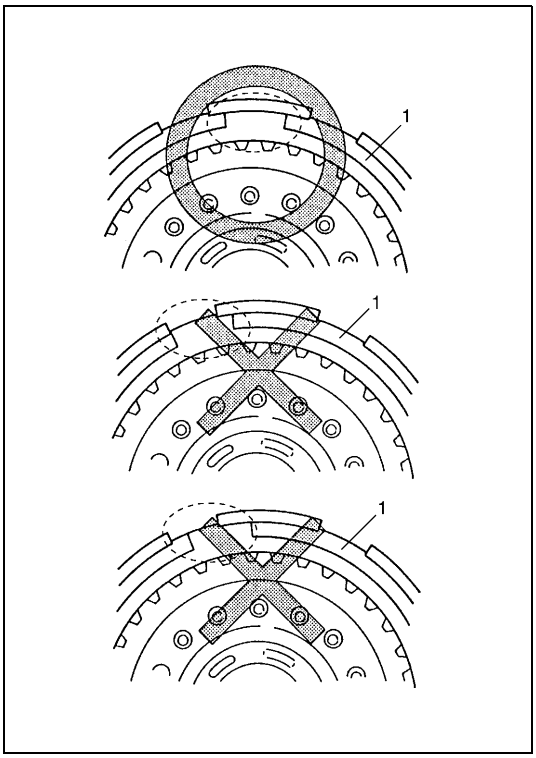


5) Install discs, plates and flange (1) in following order.
(1) Plate → (2) Disc → (3) Plate → (4) Disc → (5) Plate → (6) Disc → (7) Plate → (8) Disc → (9) Plate → (10) Disc → (11) Flange

NOTE:

Before assembly, new discs should be soaked in automatic transmission fluid for at least 2 hours.



6) Install snap ring (1).

NOTE:

Make sure that the ends of the snap ring do not come to the opening of the input shaft subassembly.

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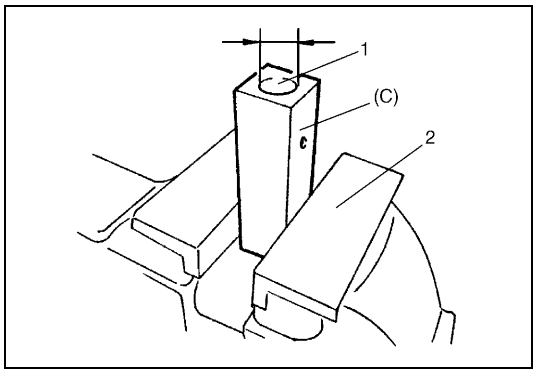
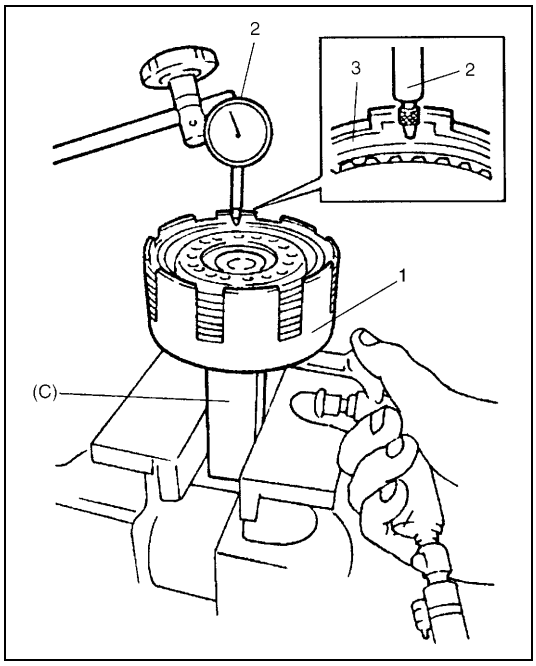


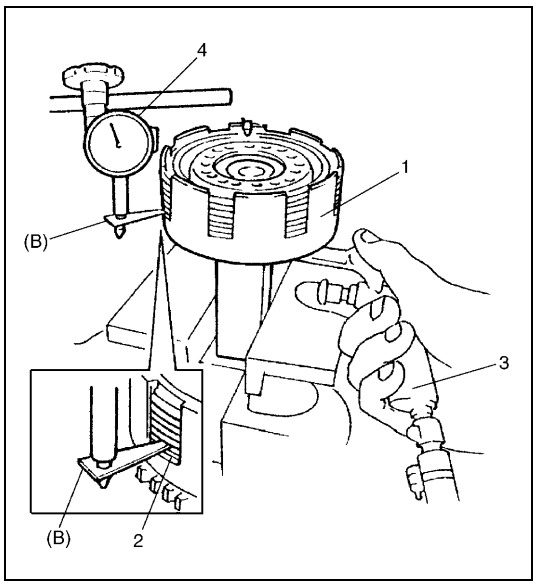
7) Place special tool (C) on soft jawed vise (2) with wider opening (1) facing up.

Special tool
(C) : 09926-26040



8) Place rear clutch assembly (1) on special tool (C).
9) Set dial gauge (2) on the top of clutch flange (3) and measure clearance by blowing compressed air (4 kg/cm^2, 57 psi) as shown in figure.
If the clearance is out of specification, replace clutch discs, plates and flange.

Rear clutch disc clearance
: 0.80 – 1.40 mm (0.031 – 0.055 in.)



10) Attach special tool (B) to dial gauge (4) and set them on the lowest clutch plate (2).

Special tool
(B) : 09952-06010

11) Measure piston stroke by blowing compressed air (4 kg/cm^2, 57 psi) as shown in figure.
If the piston stroke is out of specification, replace clutch discs, plates and flange.

Rear clutch piston stroke
: 1.93 – 2.13 mm (0.076 – 0.084 in.)

1.	Rear clutch assembly
3.	Air gun

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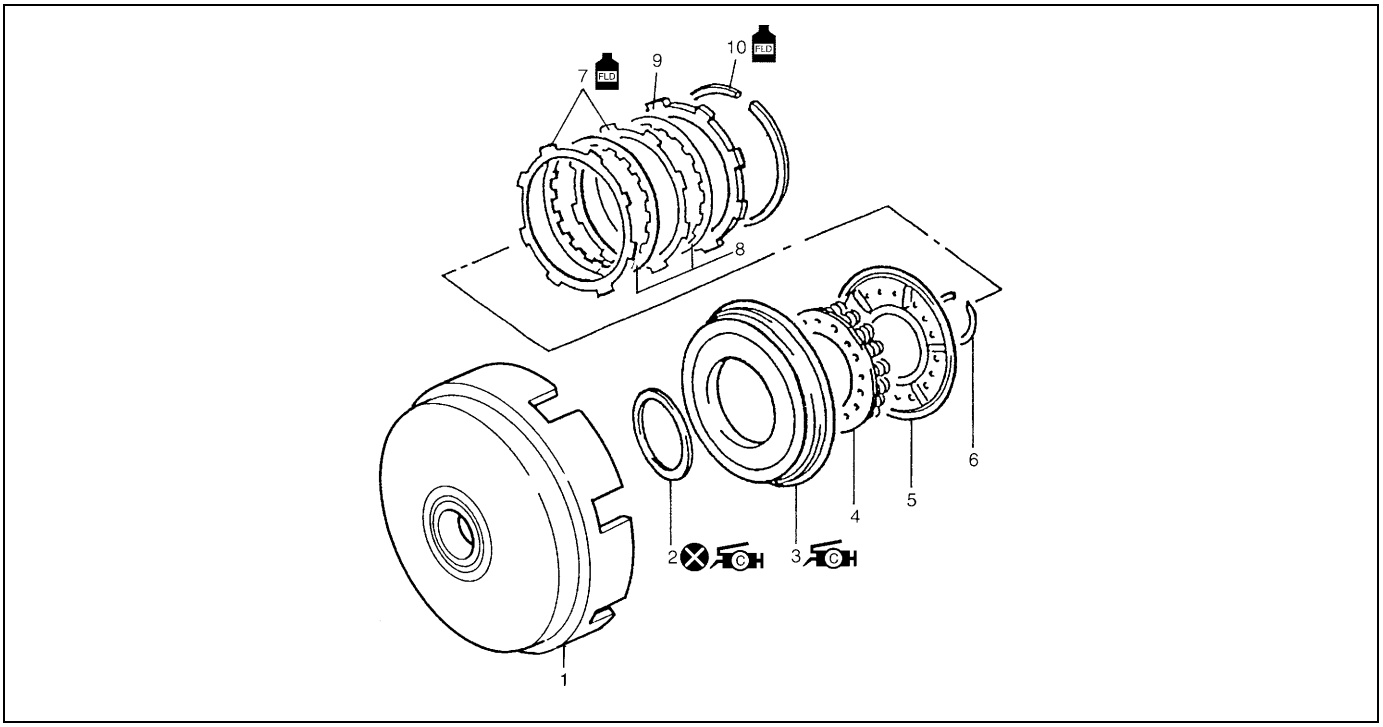
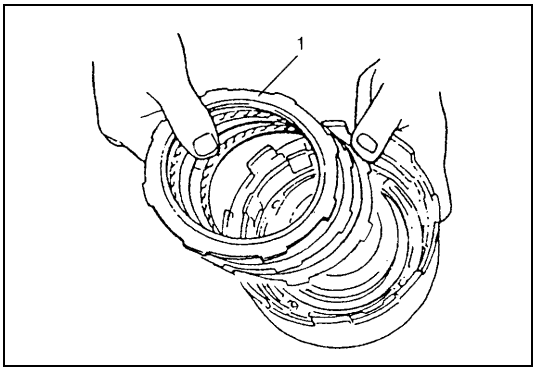
DIRECT CLUTCH (C0 CLUTCH)

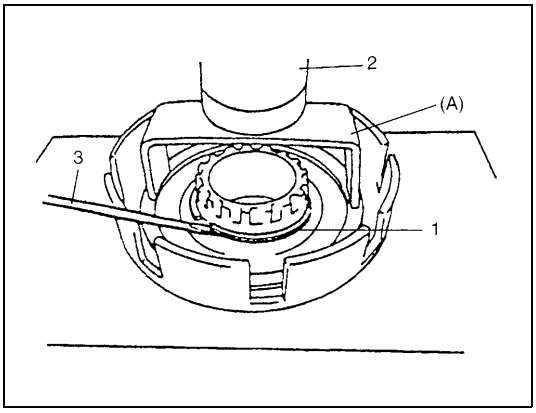


	1. Direct clutch (C0) No.1 drum	5. Direct clutch balancer	9. Clutch flange
C H	2. D-ring : Apply grease 99000-25030 to all over surface.	6. Shaft snap ring	10. Snap ring
C H	3. Direct clutch piston : Apply grease 99000-25030 to the lip of the piston.	7. Clutch plate	FLD Apply automatic transmission fluid.
	4. Direct clutch return spring seat	8. Clutch disc	Do not reuse.

DISASSEMBLY



1) Remove snap ring.
2) Remove flange (1), discs and plates.



3) Remove shaft snap ring (1).
   Compress piston return springs and remove shaft snap ring. Place special tool (clutch spring compressor) on spring seat and compress spring with a press (2), and then remove shaft snap ring, using a flat end rod or the like (3).

CAUTION:
Do not push down return spring more than necessary.

Special tool
(A) : 09926-96010

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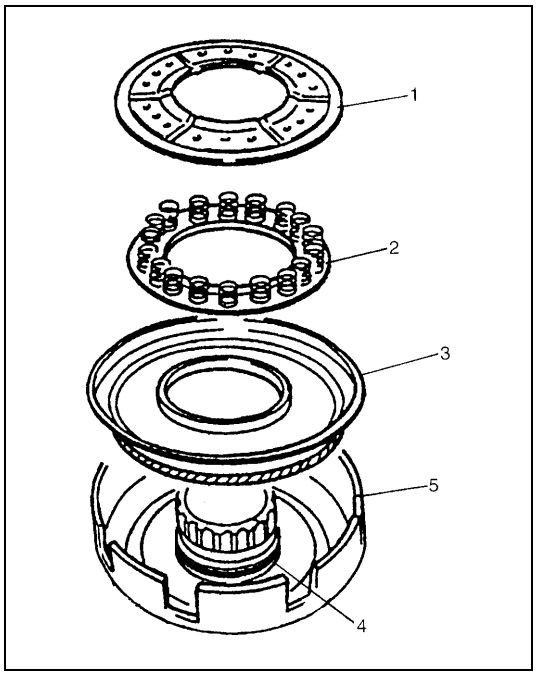
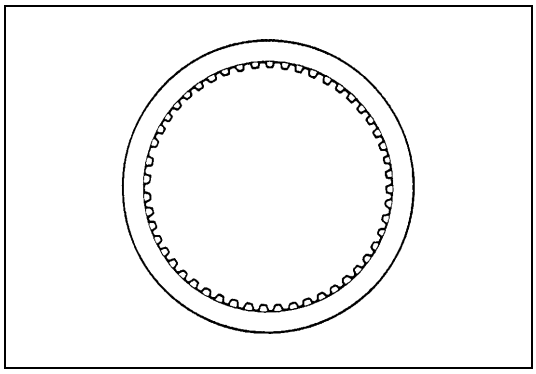


4) Remove direct clutch balancer (1) and direct clutch return spring seat (2).
5) Remove direct clutch piston (3).
   Blow compressed air through input shaft oil hole to remove piston. If piston does not pop out, take it out with long nose pliers.
6) Remove D-ring (4) from direct clutch No.1 drum (5).

INSPECTION

Clutch Discs, Plates and Flange

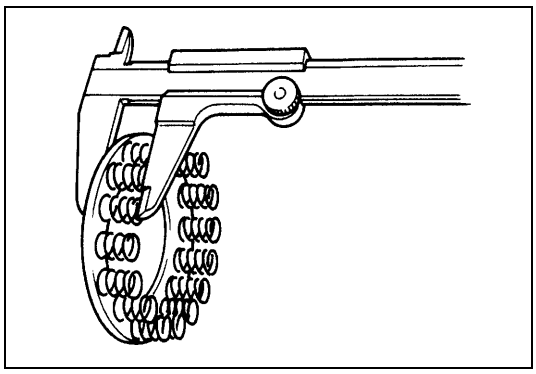


Check that sliding surfaces of discs, plates and flanges are not worn or burnt. If necessary, replace.

NOTE:

- **If disc lining is exfoliated or discolored, replace all discs.**
- **Before assembling new discs, soak them in A/T fluid for at least two hours.**

Direct Clutch Return Spring Seat



Measure height of direct clutch return spring.

Height of direct clutch return spring
: 16.3 mm (0.642 in.)

NOTE:

- **Do not apply excessive force when measuring spring height.**
- **Perform measurement at several points.**

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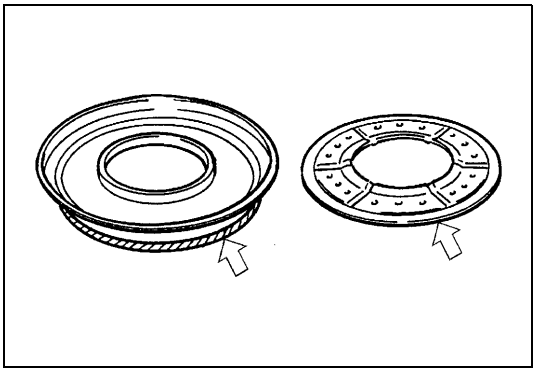
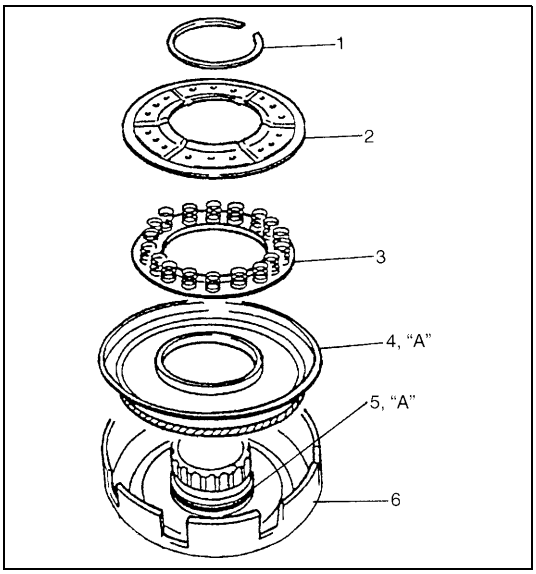
Direct Clutch Piston Lip and Direct Clutch Balancer Lip



Check each lip for wear, deformation, cut, and/or hardening. If necessary, replace.

ASSEMBLY



1) Install new D-ring (5) to direct clutch No.1 drum (6).
   Apply grease to D-ring and fit it to drum.

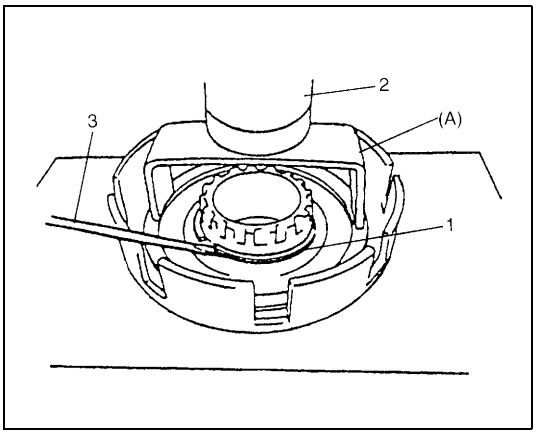
   "A": Grease 99000-25030

2) Install piston (4) into direct clutch No.1 drum.
   Use care that the piston lip does not get twisted or caught.
   Apply grease to the lip of the piston.

   "A": Grease 99000-25030

3) Install direct clutch return spring seat (3) and direct clutch balancer (2).

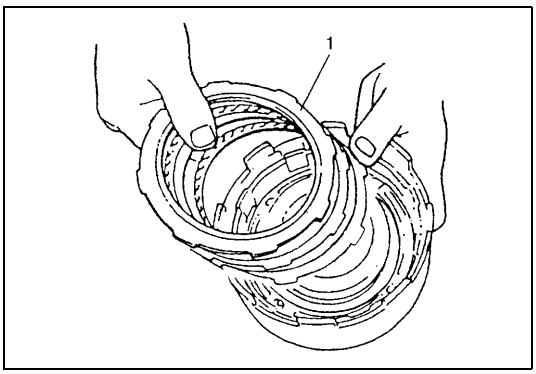
1. Snap ring



4) Install new shaft snap ring (1).
   Compress return springs and install shaft snap ring in groove by using a flat end rod or the like (3).
   Place special tool (clutch spring compressor) on spring seat and compress springs with a press (2).

CAUTION:
Do not compress return spring more than necessary.

Special tool
(A) : 09926-96010



5) Install discs, plates and flange (1) in following order.
   (1) Flange No.1 → (2) Disc → (3) Plate → (4) Disc → (5) Flange No.2

NOTE:

Before assembly, new discs should be soaked in automatic transmission fluid for at least 2 hours.

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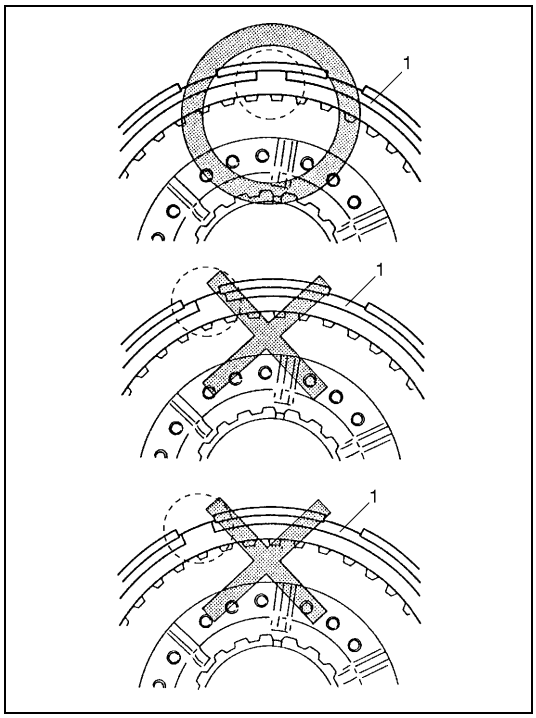
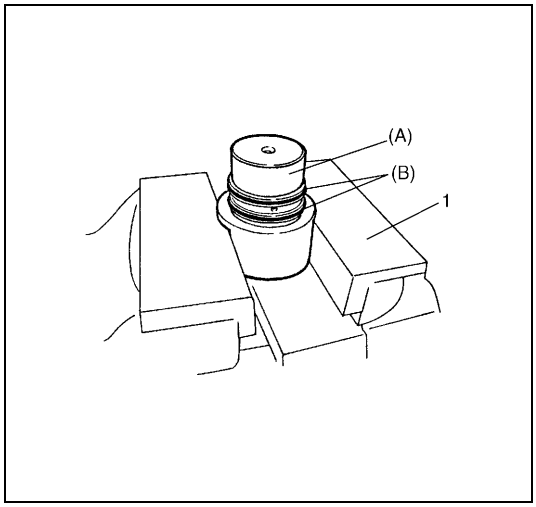


6) Install snap ring (1).

NOTE:

Make sure that the ends of the snap ring do not come to the opening of the front clutch No.1 drum.

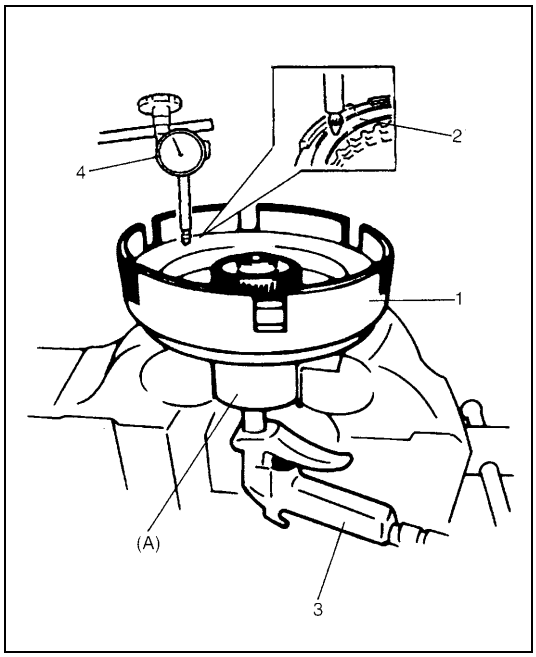


7) Place special tool (A) on soft jawed vise (1) and install 2 oil seal rings on special tool.

Special tool
(A) : 09926-26050
(B) : Rear cover seal ring 24742-78F10 SUZUKI GENUINE PARTS

NOTE:

- **Rear cover seal set has two seal rings in a set.**
- **Do not use the seal rings removed from rear cover. It is not necessary to remove seal rings from special tool once installed.**



8) Place direct clutch assembly (1) on special tool (A).
9) Set dial gauge (4) on the top of clutch flange (2) and measure clearance by blowing compressed air (4 kg/cm^2, 57 psi) as shown in figure.
If the clearance is out of specification, replace clutch discs, plates and flange.

Direct clutch disc clearance
: 0.50 – 1.04 mm (0.0197 – 0.0409 in.)

3. Air gun

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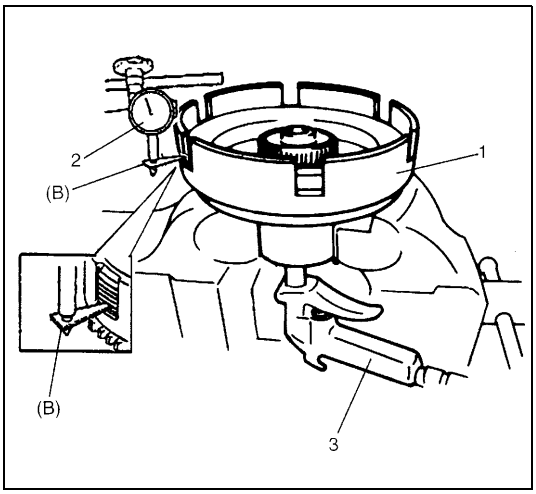


10) Attach special tool (B) to dial gauge (2) and set them on the lowest clutch plate.

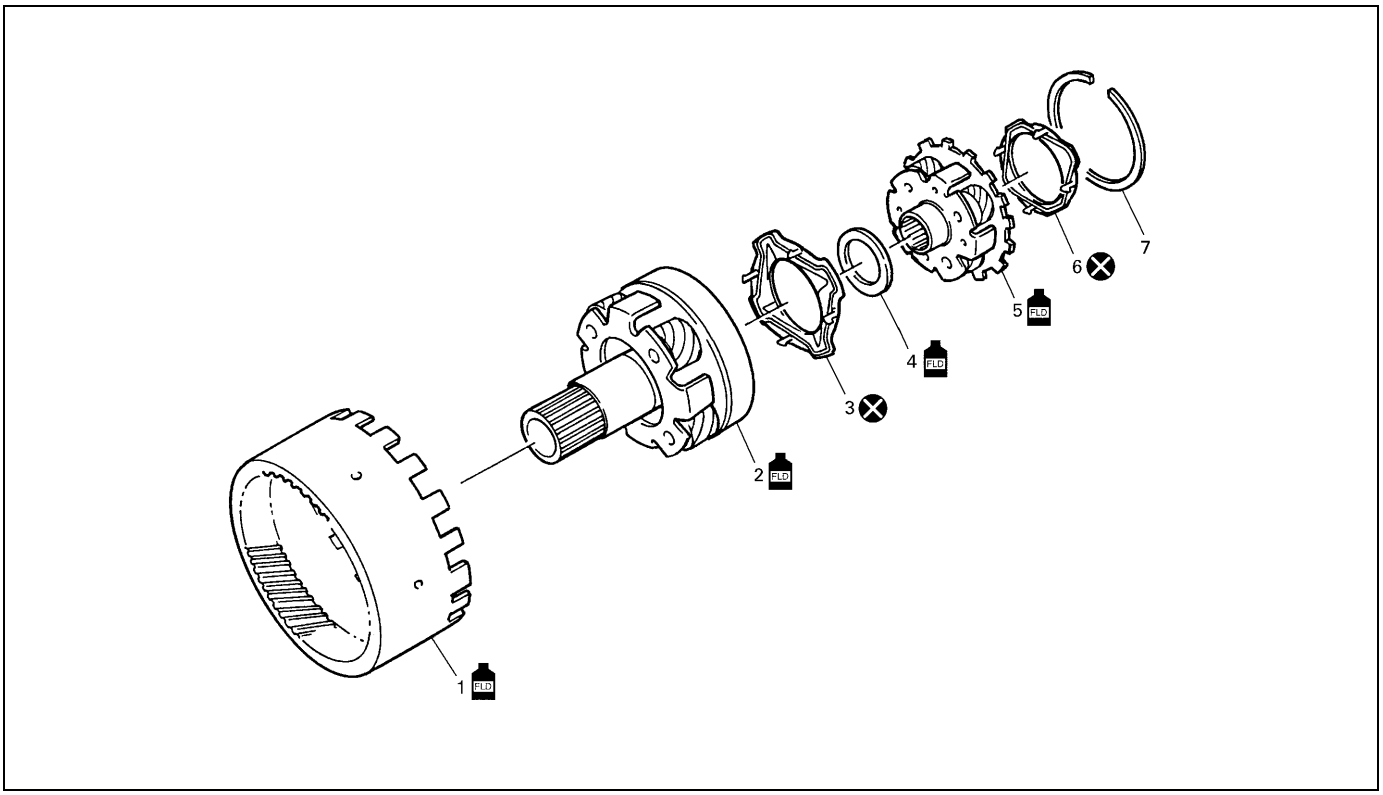
Special tool
(B) : 09952-06010

11) Measure piston stroke by blowing compressed air (4 kg/cm^2, 57 psi) as shown in figure.

Direct clutch piston stroke
: 0.96 – 1.14 mm (0.0378 – 0.0449 in.)

1.	Direct clutch assembly
3.	Air gun

PLANETARY SET



1. Planetary ring gear No.2	4. Thrust needle roller bearing	7. Snap ring
2. Planetary gear assembly No.2	5. Planetary gear assembly No.1	FLD Apply automatic transmission fluid.
3. Planetary oil receiver No.2	6. Planetary oil receiver No.1	⊗ Do not reuse.

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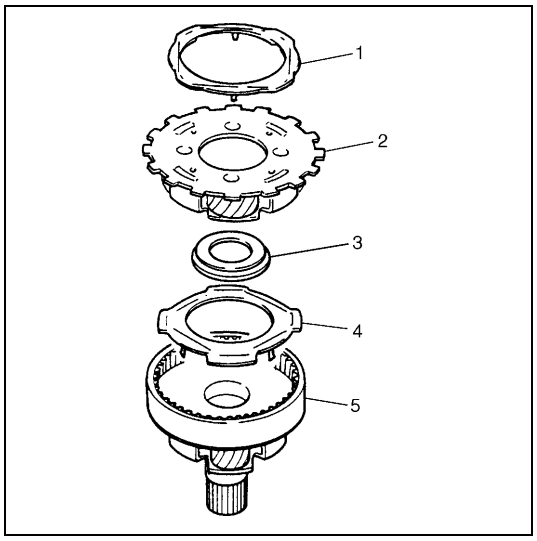
DISASSEMBLY

1) Remove snap ring.
   Remove planetary ring gear No.2.

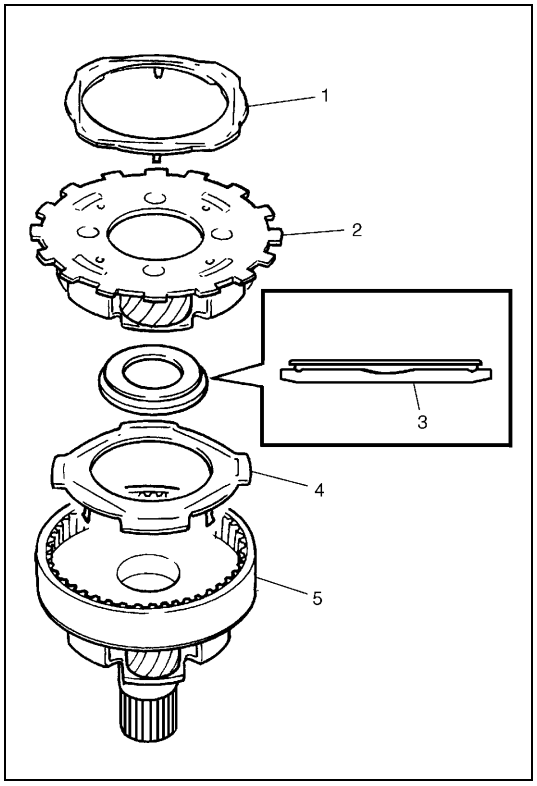


2) Remove planetary oil receiver No.1 (1) and planetary gear assembly No.1 (2) from planetary gear assembly No.2 (5).
3) Remove needle roller bearing (3) and planetary oil receiver No.2 (4) from planetary gear assembly No.2.

NOTE:

Do not reuse oil receivers (1 and 4).

ASSEMBLY



1) Install new planetary oil receiver No.2 (4) and needle roller bearing (3) to planetary gear assembly No.2 (5).

NOTE:

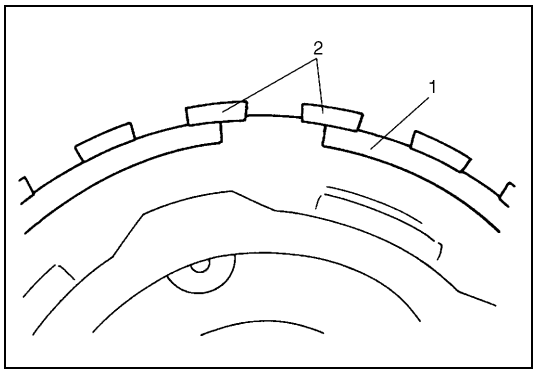
- **Note the direction of needle roller bearing.**
- **Take care not to break the claw of oil receiver.**

2) Install planetary gear assembly No.1 (2) to planetary gear assembly No.2 (5).
3) Install new planetary oil receiver No.1 (1).

NOTE:

Take care not to break the claw of oil receiver.

4) Assemble planetary ring gear No.2 and planetary gear assembly No.2.



5) Install snap ring (1).

NOTE:

Note the location of the ends of the snap ring.

2. Planetary ring gear No.2

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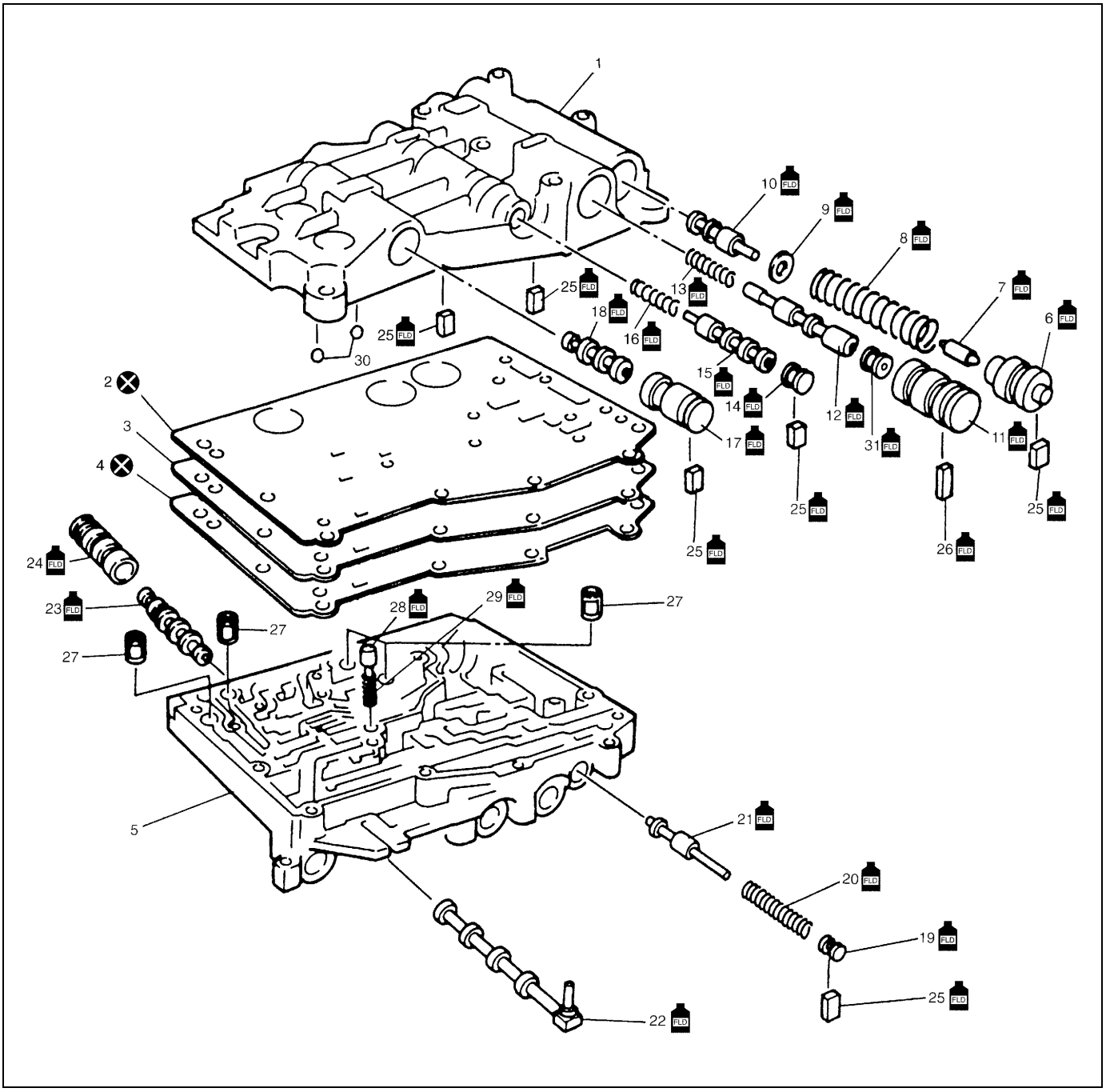
VALVE BODY



1. Upper valve body	12. Lock-up control valve	23. Fail valve No.1
2. Upper valve body gasket	13. Lock-up control valve spring	24. Fail valve No.1 sleeve
3. Valve body plate	14. Lock-up signal valve plug	25. Key (short)
4. Lower valve body gasket	15. Lock-up signal valve	26. Key (long)
5. Lower valve body	16. Lock-up signal valve spring	27. Oil strainer
6. Primary regulator valve sleeve	17. Fail valve No.2 sleeve	28. Cooler by-pass valve
7. Primary regulator valve plunger	18. Fail valve No.2	29. Cooler by-pass valve spring
8. Primary regulator valve spring	19. Secondary regulator valve plug	30. Steel ball
9. Washer	20. Secondary regulator valve spring	31. Lock-up control valve
10. Primary regulator valve	21. Secondary regulator valve	FLD Apply automatic transmission fluid.
11. Lock-up control valve sleeve	22. Manual valve	⊗ Do not reuse.

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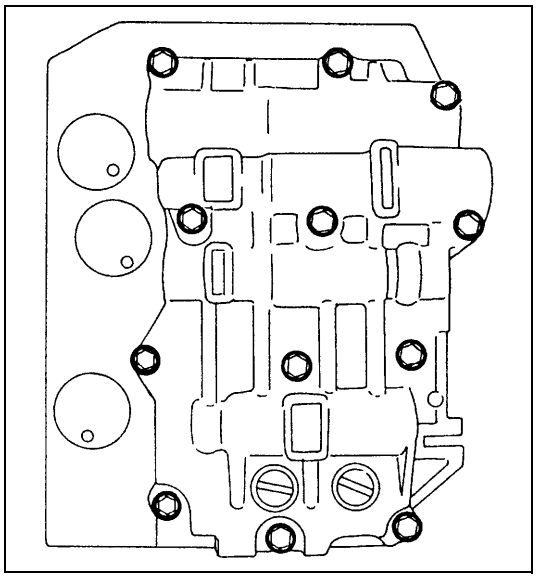
DISASSEMBLY

Valve Body Assembly

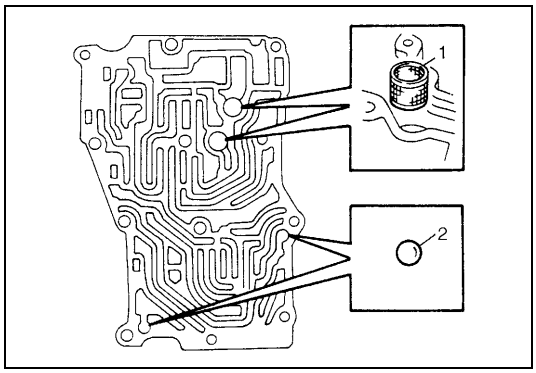


1) Remove manual valve.
2) Remove 12 bolts from lower valve body.

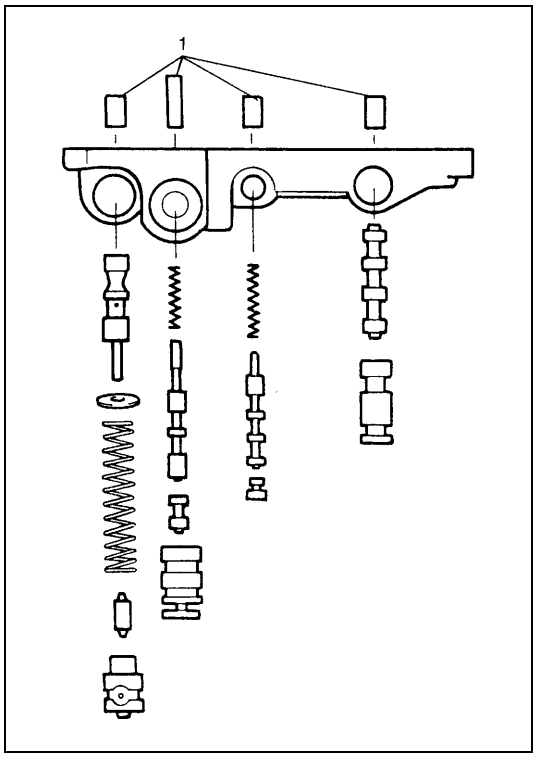
NOTE:

- **There are 4 different kinds of bolt fixing upper and lower valve body. Do not mix them up and remember where they belong to.**
- **When separating lower and upper valve body, be careful not to let the steel ball to fall off.**

Upper Valve Body



1) Remove oil strainers (1) and steel balls (2).



2) Remove keys (1).
3) Pull out all sleeves, valves, plungers, springs and washer.

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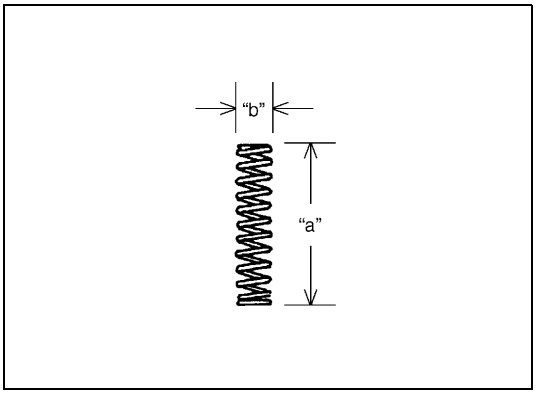
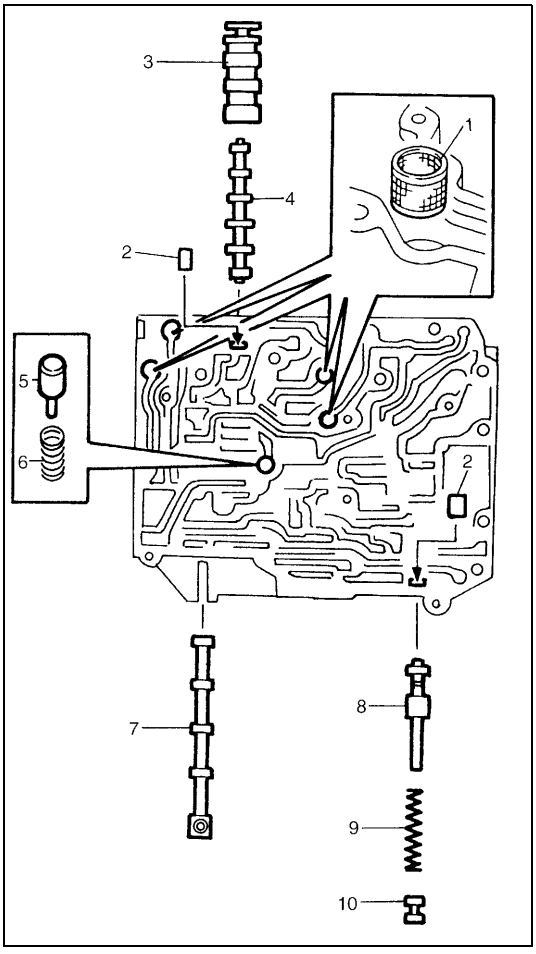


Valve spring dimensions (Reference)

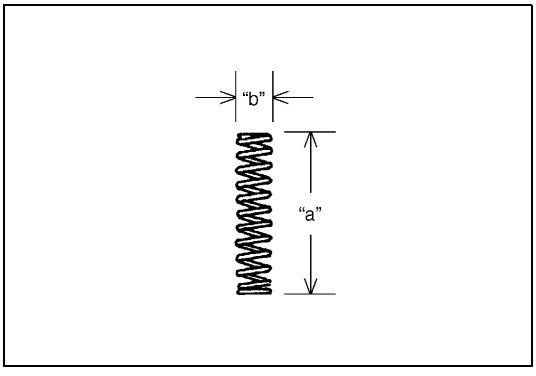
Spring	Free length "a" (mm)	Outside diameter "b" (mm)
Primary regulator valve spring	79.2	18.0
Lock-up control valve spring	31.1	8.5
Lock-up signal valve spring	36.1	8.5

Lower Valve Body



1) Remove oil strainers (1).
2) Remove solenoid valves, if still attached.
3) Remove keys (2) and pull out all sleeve, plug, spring and valves.

3.	Fail valve No.1 sleeve
4.	Fail valve No.1
5.	Cooler by-pass valve
6.	Cooler by-pass valve spring
7.	Manual valve
8.	Secondary regulator valve
9.	Secondary regulator valve spring
10.	Secondary regulator valve plug



Valve spring dimensions (Reference)

Spring	Free length "a" (mm)	Outside diameter "b" (mm)
Secondary regulator valve spring	38.7	8.8
Cooler by-pass valve spring	22.8	8.0

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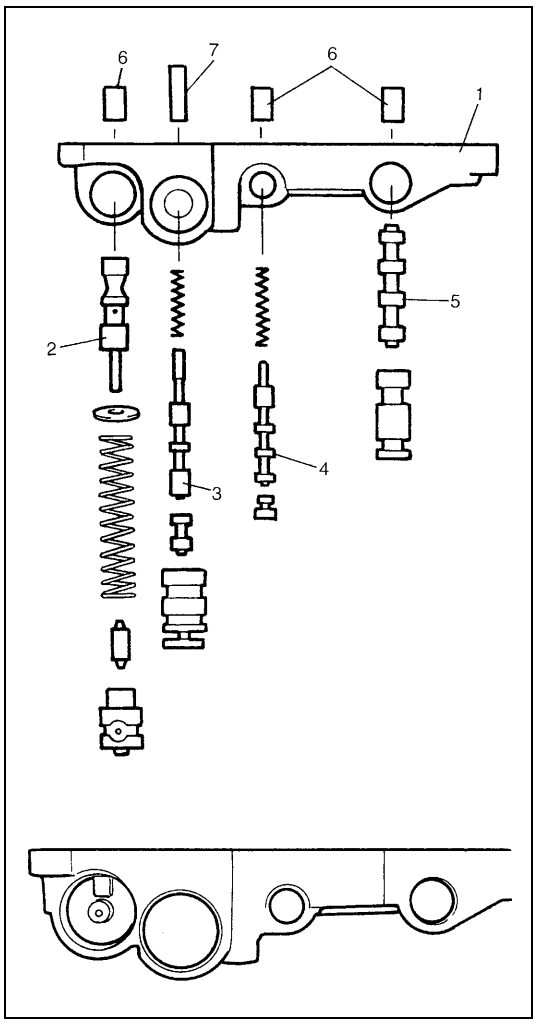
ASSEMBLY

Upper Valve Body



1) Apply A/T fluid to each valve, plate washer, spring, plunger, sleeve and key.
   Insert primary regulator valve (2) about half way then place plate washer and spring. Push in primary regulator valve assembly all the way in. Insert plunger with sleeve and hold them with the key.

NOTE:

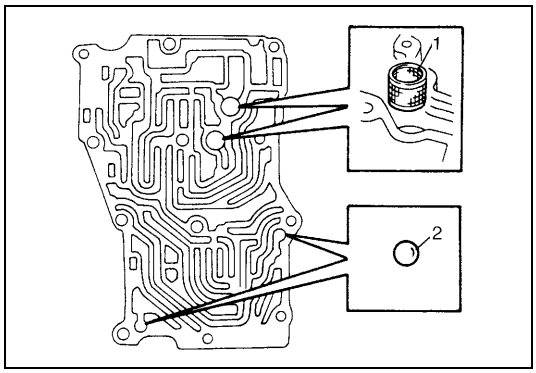
- **Note the location of the key shown in picture.**
- **Compression spring has a identification color paint of yellow.**
- **Note the direction of the primary regulator valve.**

2) Apply A/T fluid to each valve, sleeve, spring, plug and key and insert them, then fix them with the key.

NOTE:

Note the direction of the fail valve.

1.	Upper valve body
3.	Lock-up control valve
4.	Lock-up signal valve
5.	Fail valve No.2
6.	Key (short)
7.	Key (long)



3) Install oil strainers (1) and put steel balls (2).

NOTE:

Clean oil strainer before installing.

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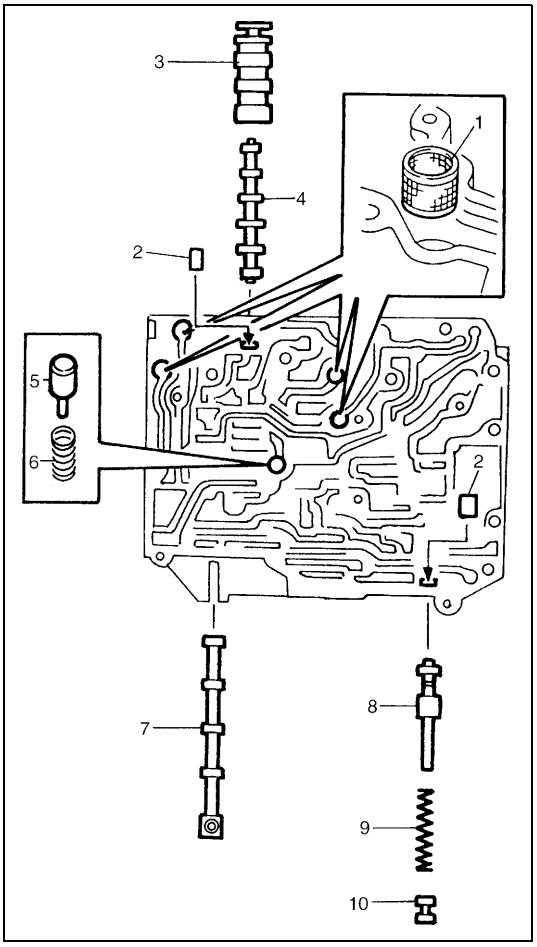
Lower Valve Body



1) Apply A/T fluid to each valve, spring, sleeve and key. Insert them, then fix with key.

NOTE:

Make sure that the fail valve No.2 and secondary regulator valve is inserted in the right direction.

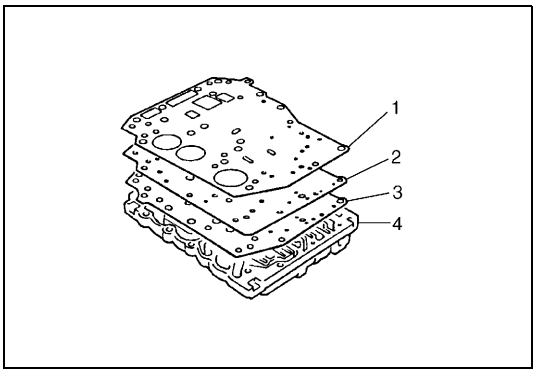
2) Insert oil strainers to lower valve body.

NOTE:

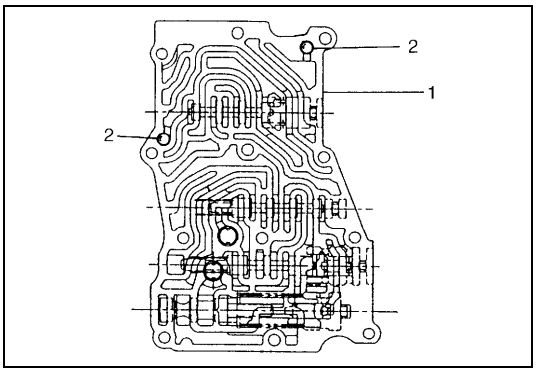
Clean oil strainer before installing.

1.	Oil strainer
2.	Key (short)
3.	Fail valve No.1 sleeve
4.	Fail valve No.1
5.	Cooler by-pass valve
6.	Cooler by-pass valve spring
7.	Manual valve
8.	Secondary regulator valve
9.	Secondary regulator valve spring
10.	Secondary regulator valve plug

VALVE BODY ASSEMBLY



1) Install new gasket for lower valve body (3), valve body plate (2) and new gasket for upper valve body (1) to lower valve body (4).



2) Make sure that steel balls (2) are at the location shown in figure.

1.	Upper valve body

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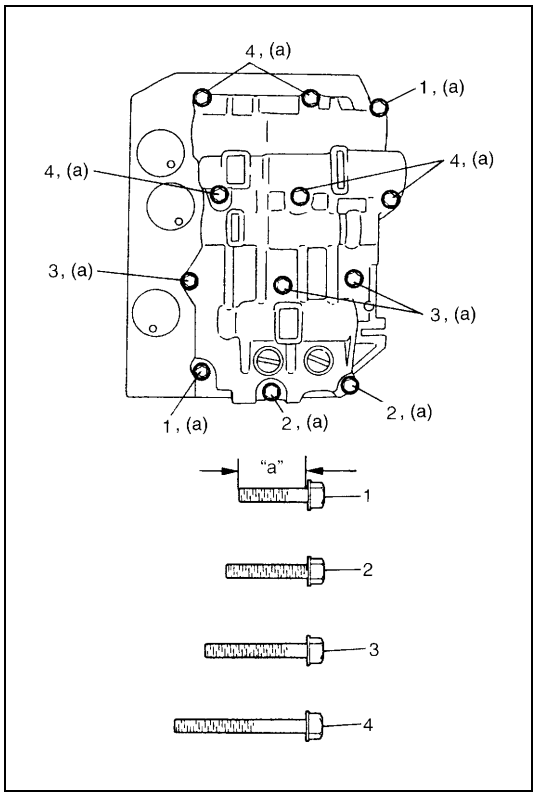

3) Assemble lower valve body with gaskets and plate over upper valve body.
First tighten bolts A then the other bolts.

Tightening torque
Valve body bolts (a) : 5.5 N·m (0.55 kg-m, 4.0 lb-ft)

NOTE:

- **Be careful not to fall steel balls off.**
- **There are four kinds of bolts fixing upper and lower valve body. Refer to the table below for the bolt specifications.**

Bolt	Length "a"	Pieces
A	20 mm (0.79 in.)	2
B	23 mm (0.91 in.)	2
C	29.5 mm (1.16 in.)	3
D	42 mm (1.65 in.)	5

1. Bolt A	3. Bolt C
2. Bolt B	4. Bolt D

4) Install manual valve to valve body assembly.

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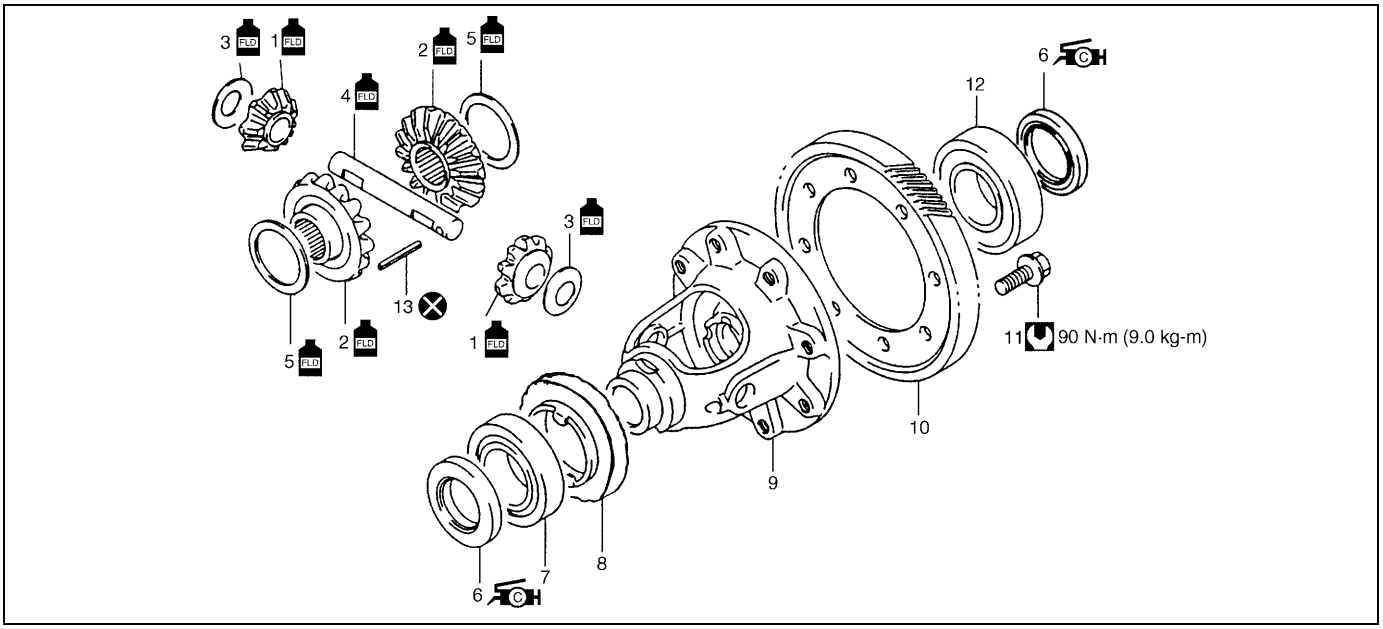
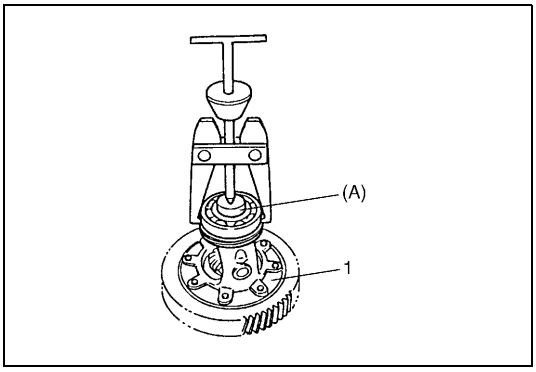
DIFFERENTIAL ASSEMBLY

Servicing procedure for differential assembly is similar to that for manual transmission. Refer to Section 7A of this manual for adjustment procedure.



1. Differential pinion	7. Differential right side bearing (R bearing)	13. Pinion shaft pin
2. Differential gear	8. Speedometer sensor rotor	FLD Apply automatic transmission fluid.
3. Washer (for pinion)	9. Differential case	Tightening torque
4. Pinion shaft	10. Final gear	Do not reuse.
5. Washer (for gear)	11. Bolt	
C H 6. Differential side oil seal : Apply grease 99000-25030 to oil seal lip.	12. Differential left side bearing (L bearing)	

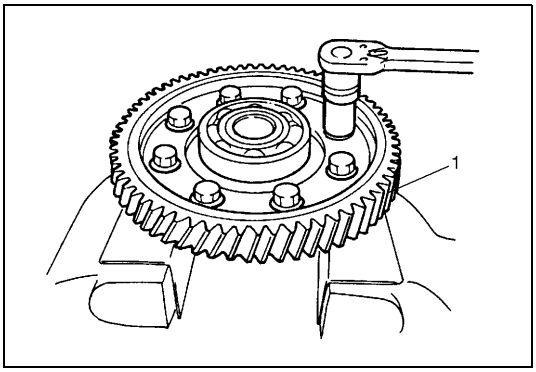
DISASSEMBLY



1) Remove R bearing and then speed sensor rotor using special tool and puller.

Special tool
(A) : 09925-88210

1. Differential gear assembly



2) Hold differential assembly with soft jawed vise, remove final gear (1).

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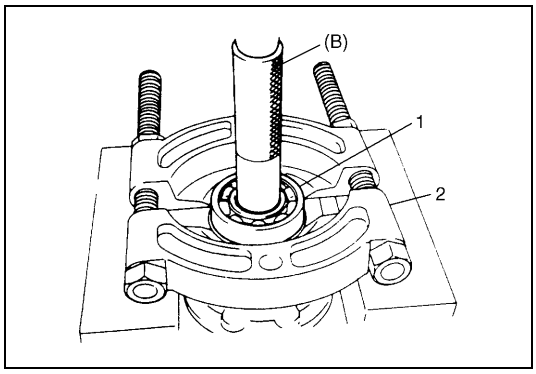
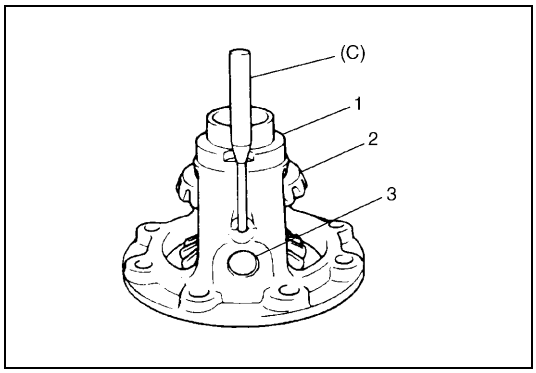


3) Remove differential side L bearing (1).
   Drive it out by using special tool, bearing puller (2) and press.

Special tool
(B) : 09913-80112



4) Remove pinion shaft pin.
   Use special tool and hammer for its removal.

Special tool
(C) : 09922-85811

5) Remove pinion shaft (3), differential pinions with each washer, differential gears (2) with each washer.

1. Differential case

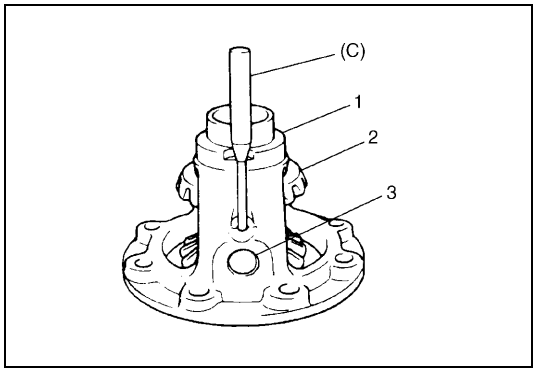
ADJUSTMENT AND REASSEMBLY

Prepare replacing parts as required and proceed to reassembly. Make sure that all parts are clean.

1) Install differential gears.
2) Measure and adjust thrust play referring to Section 7A.
   If thrust play is out of specification, select suitable thrust washer from among following available size, install it and check again that specified gear play is obtained.

Available thrust washer thickness
: 0.9, 0.95, 1.0, 1.05, 1.1, 1.15 and 1.2 mm (0.035, 0.037, 0.039, 0.041, 0.043, 0.045, and 0.047 in.)

3) Then assemble them with suitable thrust washers.



4) Drive in new pinion shaft pin from right side till it is flush with differential case surface.

Special tool
(C) : 09922-85811

1. Differential case
2. Differential gear
3. Differential pinion shaft

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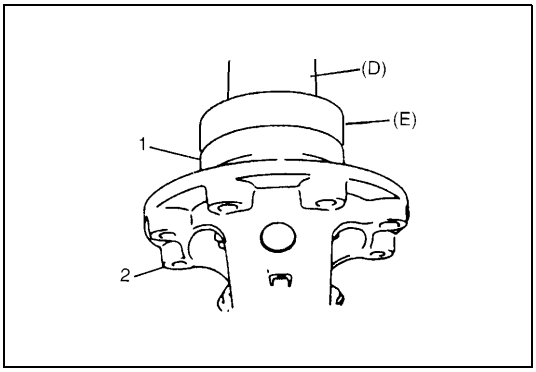
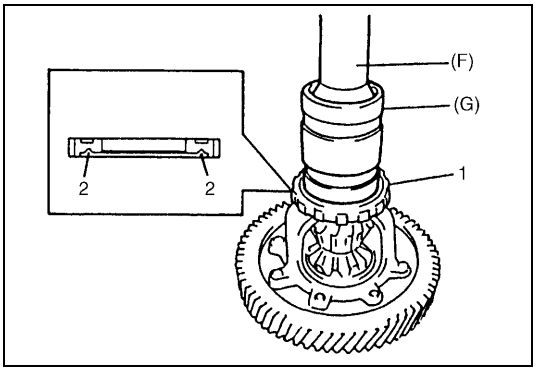


5) Install differential side L bearing (1). Press-fit it by using special tool and copper hammer.

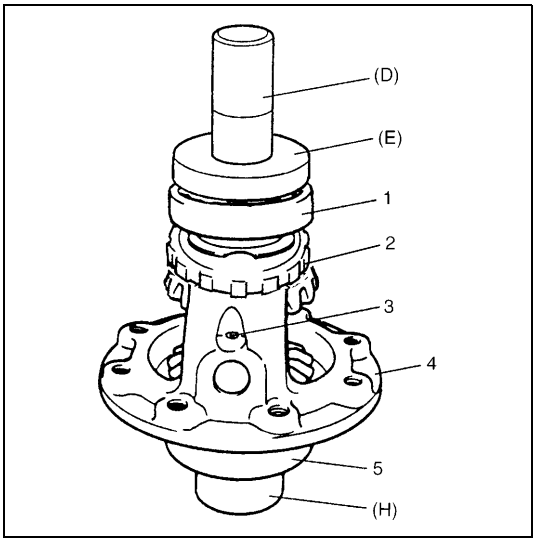
Special tool
(D) : 09924-74510
(E) : 09926-68310

2. Differential case



6) Press-fit new sensor rotor (1) with groove (2) side downward as shown by using special tools and copper hammer.

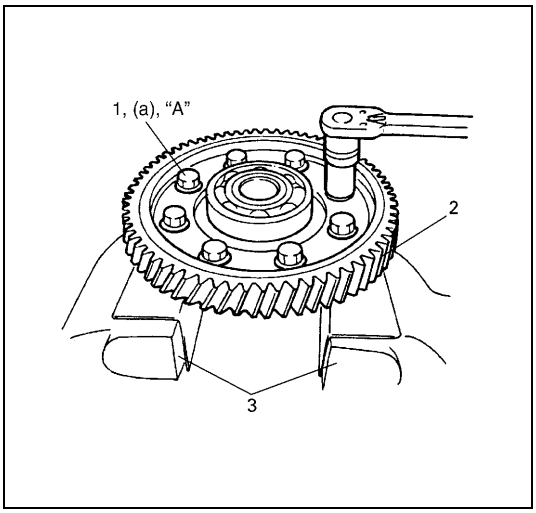
Special tool
(F) : 09951-76010
(G) : 09940-54910



7) Support differential assembly as illustrated so as to float L bearing, and then press-fit R bearing by using special tool and copper hammer.

Special tool
(D) : 09924-74510
(E) : 09926-68310
(H) : 09951-16060

1. Differential side R bearing	4. Differential case
2. Speedometer sensor rotor	5. Differential side L bearing
3. Differential pinion shaft pin	



8) Hold differential assembly with soft jawed vise (3), install final gear (2) and then tighten it with 8 bolts to which thread lock cement is applied to specified torque.

CAUTION:
Use of bolts other than specified ones is prohibited.

Tightening torque
(a) : 90 N·m (9.0 kg-m, 65.0 lb-ft)

"A" : Thread lock cement 99000-32110

1. Final gear bolt

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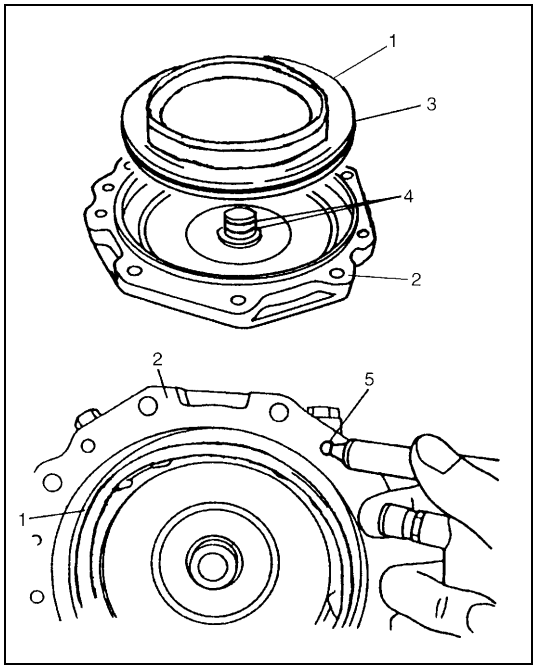
REAR COVER (O/D BRAKE PISTON ASSEMBLY)

DISASSEMBLY



1) Remove O/D brake piston (1) from rear cover (2).

NOTE:

If O/D brake piston is hard to take it out, force low-pressure compressed air (1 kg/cm^2, 15 psi, 100 kPa max) into hole (5) shown in figure and pop out piston into a rag.

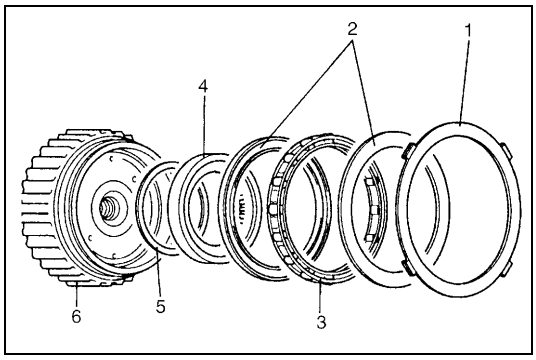
2) Remove O-ring (3) and seal ring (4).
   Replace them, if damaged.

ASSEMBLY

1) Install seal rings to rear cover and O-rings to O/D brake piston.
2) Apply grease to O-rings and install O/D brake piston to rear cover.

PLANETARY SUN GEAR NO.1 ASSEMBLY

DISASSEMBLY



1) Remove one-way clutch retainer (1) from planetary sun gear No.1 assembly.

NOTE:

Do not reuse retainer.

2) Remove one-way clutch bearings (2), one-way clutch (3), inner race (4) and washer (5) from planetary sun gear No.1 (6).

ASSEMBLY

Reverse removal procedure noting followings.

- When installing retainer, fit 2 hooks of retainer on planetary sun gear No.1 and tap the other 2 hooks with plastic hammer.

After assembling, make sure that :

- There is no clearance between retainer and bearing.

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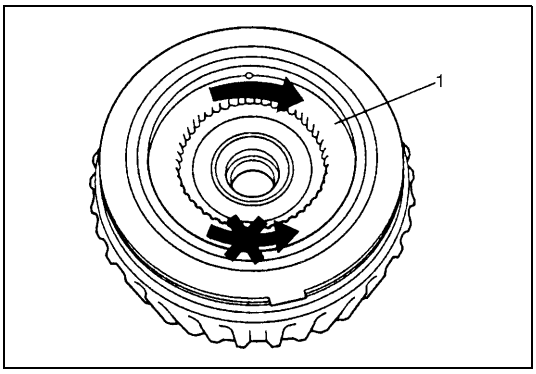
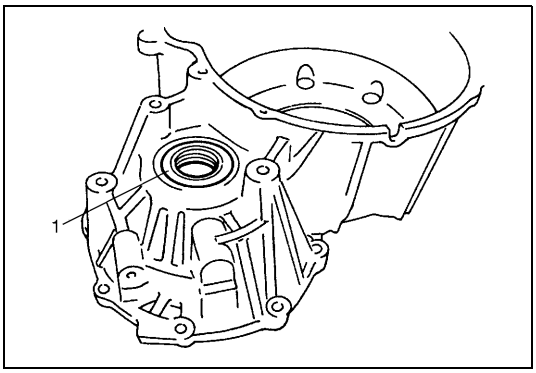


- Inner race (1) can rotate only one direction shown in figure.

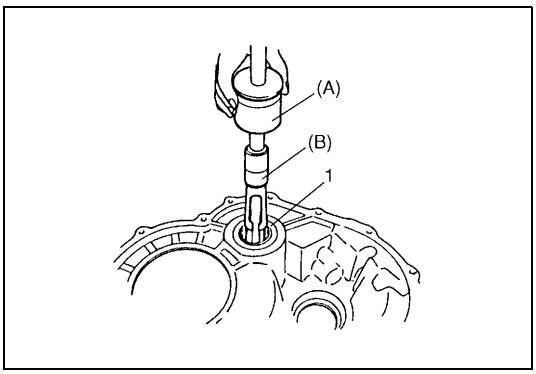
- Fit 2 protrusions of washer to holes of planetary sun gear No.1.

TORQUE CONVERTER HOUSING

DISASSEMBLY



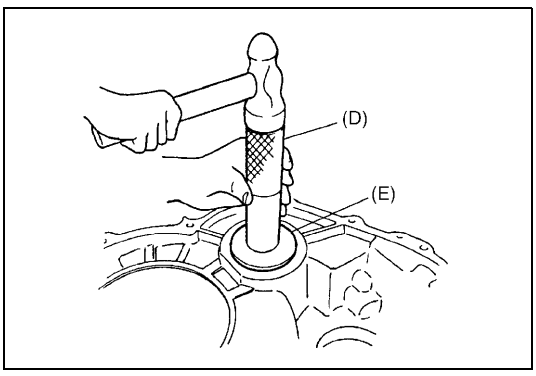
1) Remove oil seal (1).



2) Remove counter bearing (1) using special tools.

Special tool
(A) : 09930-30102
(B) : 09923-74510

ASSEMBLY



1) Install counter bearing to torque converter housing.
Use special tools and a hammer to press fit the bearing to torque converter housing.

Special tool
(D) : 09924-74510
(E) : 09944-68510

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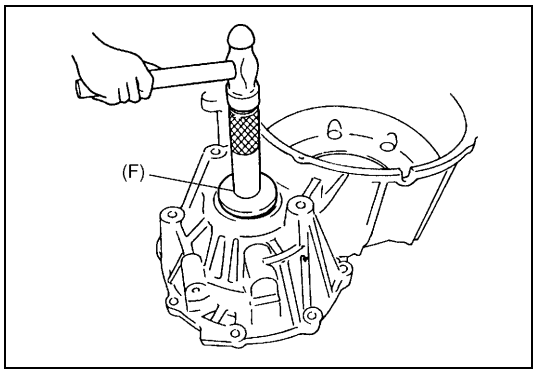
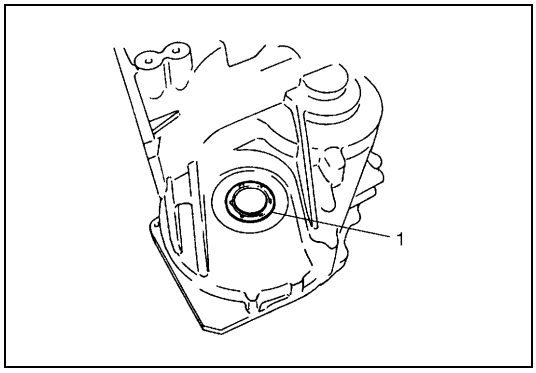


2) Install new oil seal to torque converter housing.
Use special tool to press-fit oil seal until the oil seal end face is flush with torque converter housing end face.

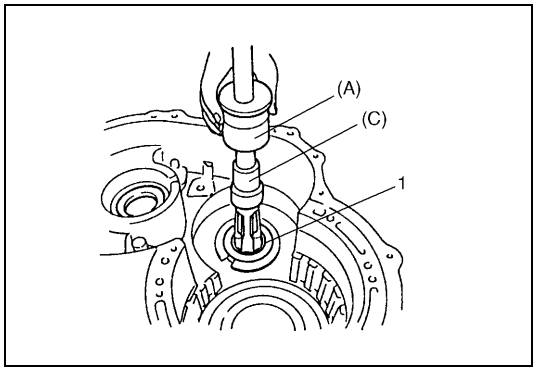
Special tool
(F) : 09940-53111

TRANSMISSION CASE

DISASSEMBLY



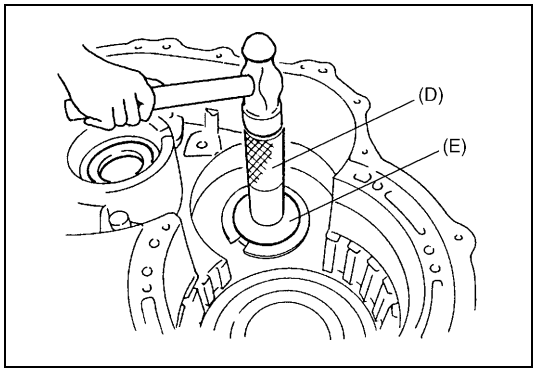
1) Remove oil seal (1).



2) Remove counter bearing (1) using special tools.

Special tool
(A) : 09930-30102
(C) : 09941-64511

ASSEMBLY



1) Install counter bearing using special tools.

Special tool
(D) : 09924-74510
(E) : 09944-68510

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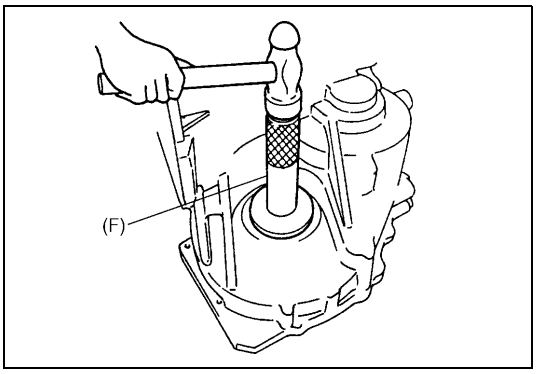

2) Install new oil seal to transmission case.
   Use special tool to press-fit oil seal until oil seal end face is flush with transmission case end face.

Special tool
(F) : 09913-75510

UNIT ASSEMBLY

CAUTION:
- **Automatic transmission consists of highly precise parts. As even a flaw in a small part may cause oil leakage or decrease in function, check each part carefully before installation.**
- **Clean all parts with compressed air. Never use wiping cloths or rags.**
- **Before assembling new clutch discs and brake band, soak them in automatic transmission fluid for at least 2 hours.**
- **Be sure to use new gaskets and O-rings.**
- **Lubricate O-rings with automatic transmission fluid.**
- **Apply automatic transmission fluid on sliding or rotating surfaces of the parts before assembly.**
- **Use yellow petrolatum grease or Suzuki Super Grease C to retain parts in place.**
- **Be sure to install thrust bearings and races in correct direction and position.**
- **Make sure that snap ring ends are not aligned with one of cutouts and are installed in groove correctly.**
- **Do not use adhesive cements on gaskets and similar parts.**
- **Be sure to torque each bolt and nut to specification.**

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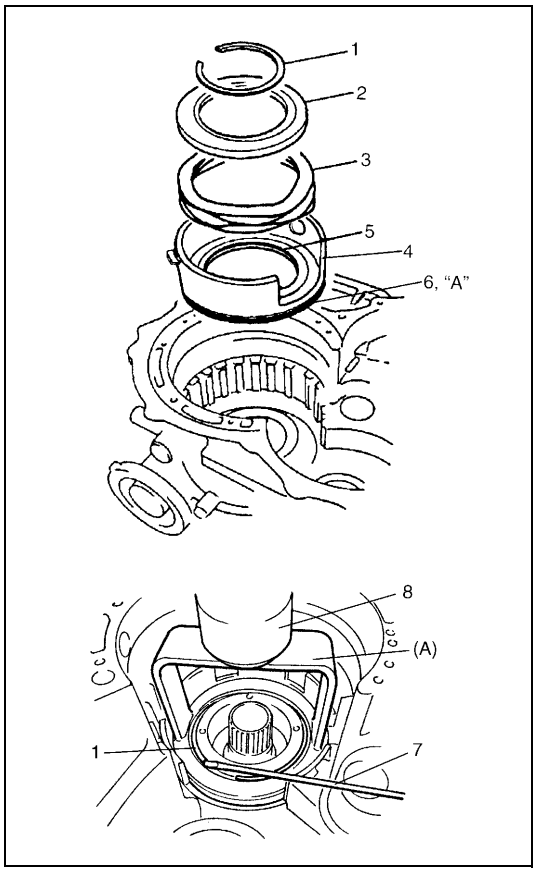


1) Install new O-rings (inside (5) and outside (6)) to reverse brake piston (4), and apply grease to them.

"A" : Grease 99000-25030

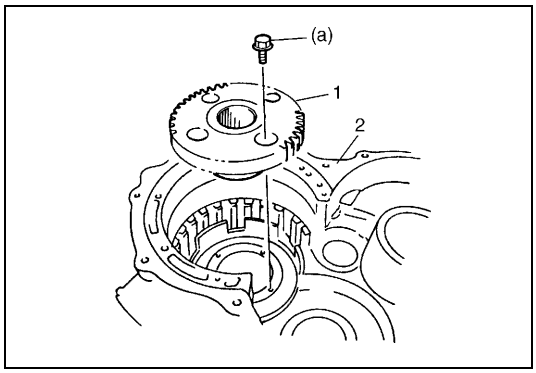
2) Install reverse brake piston (4), wave spring (3) and reverse brake piston seat (2) to transmission case.
3) Install new snap ring (1) by compressing wave spring thru reverse brake piston seat with hydraulic press (8) and special tool.

NOTE:

Don't compress wave spring more than necessary or it may get damaged.

Special tool
(A) : 09926-96040

7. Flat end rod or the like



4) Install counter drive gear (1).

Tightening torque
Counter drive gear installing bolts
(a) : 5.5 N·m (0.55 kg-m, 4.0 lb-ft)

2. Transmission case

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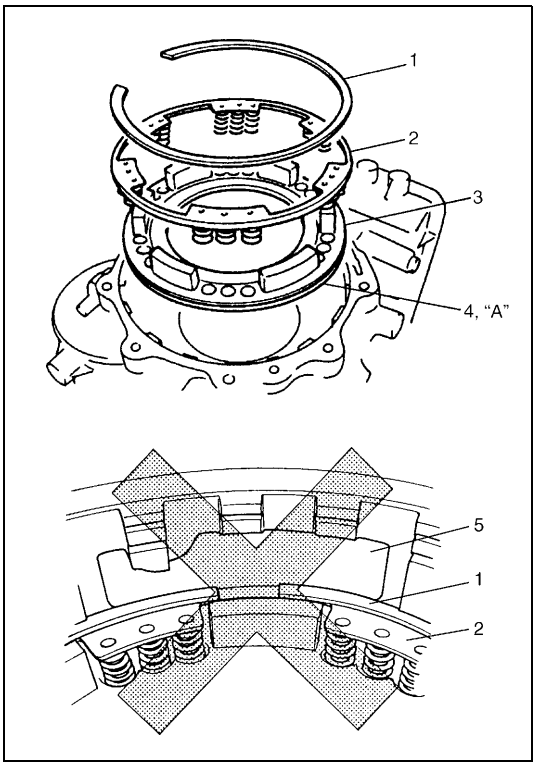
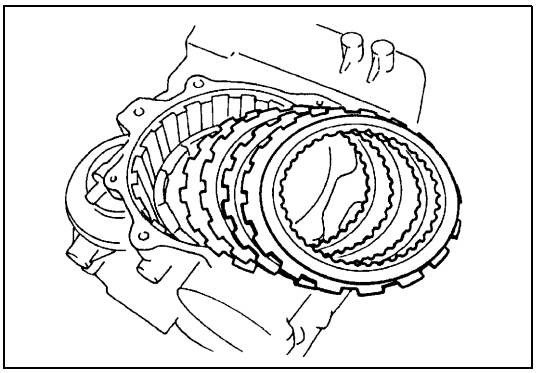


5) Install new inner and outer O-rings (4) to 1st & 2nd brake piston (3) and apply grease to them.

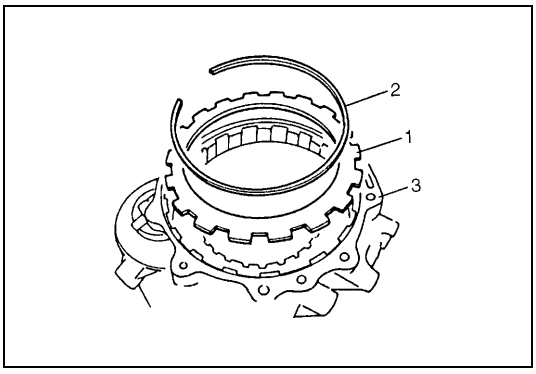
"A" : Grease 99000-25030

6) Install 1st & 2nd brake piston (3) to transmission case, in such way that the side with spring holes comes to the top. Make sure that the O-rings are not twisted or caught.
7) Place 1st & 2nd brake piston return spring subassembly (2) on piston (3). Make sure that each spring fits the holes on the piston.
8) Push down return spring subassembly and install snap ring (1).

CAUTION:
Check that the opening of snap ring does not face the cored-hole (5) of the transmission case.



9) Install 1st & 2nd brake (B1) discs and plates in following order.
(1) Plate → (2) Disc → (3) Plate → (4) Disc → (5) Plate → (6) Disc → (7) Plate → (8) Disc
10) Hold above parts with snap ring.



11) Install brake flange (1) and snap ring (2) to transmission case (3).

NOTE:
The flat surface of the flange comes to the top (must face O/D brake piston).

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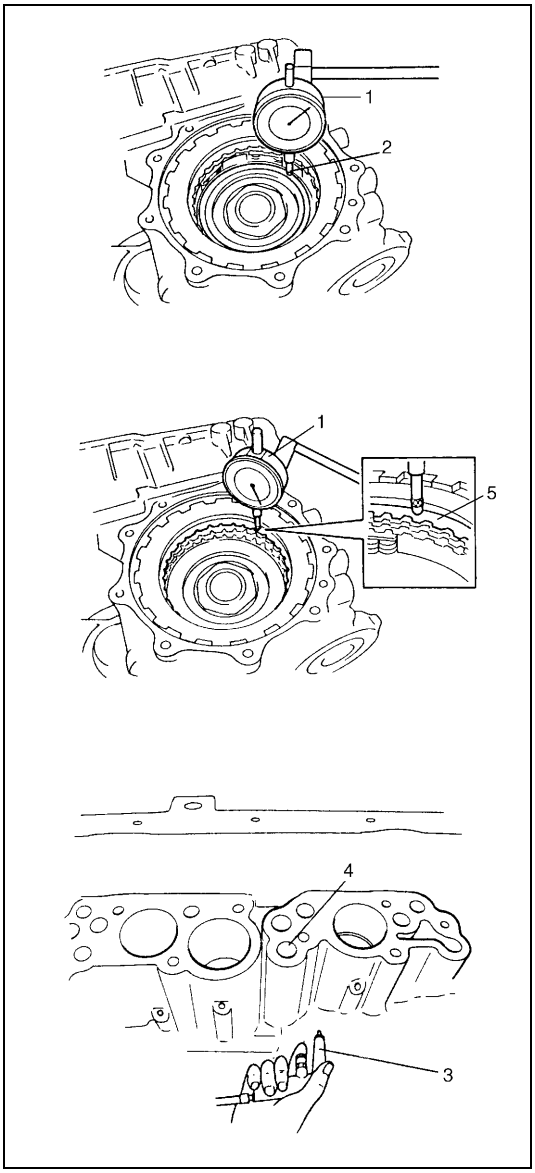


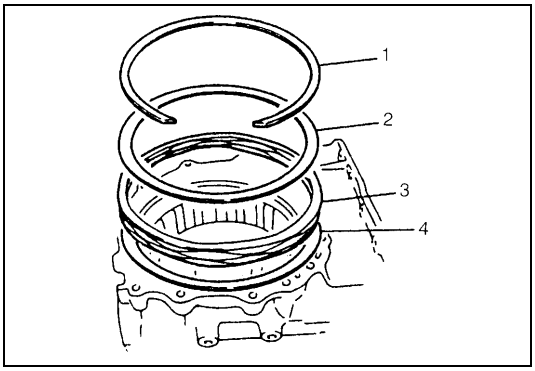
12) Measure 1st & 2nd brake (B1) stroke and clearance in following manner.
- Set the dial gauge (1) to 1st & 2nd brake (B1) piston as shown. Blow compressed air into hole (4) shown in figure. Then measure the difference as the compressed air is blown in.

1st & 2nd brake (B1) piston stroke
Standard : 1.79 – 2.01 mm (0.0705 – 0.0791 in.)

- Set the dial gauge (1) on the top-most brake disc (5). Blow compressed air into the hole (4) shown in figure. Measure the difference. Call this value (A). If the measured value (s) is (are) out of specification, replace brake discs, plates and flange.

1st & 2nd brake (B1) disc clearance
Standard : 1.31 – 1.96 mm (0.0516 – 0.0772 in.)

2. Tip of dial gauge on B1 brake piston
3. Air gun



13) Install O/D brake (B0) return spring seat (4), return spring (3) and then retainer (2).
14) While compressing retainer (2), install snap ring (1).

CAUTION:
Position return spring (3) to be centered so that rear cover not be caught.

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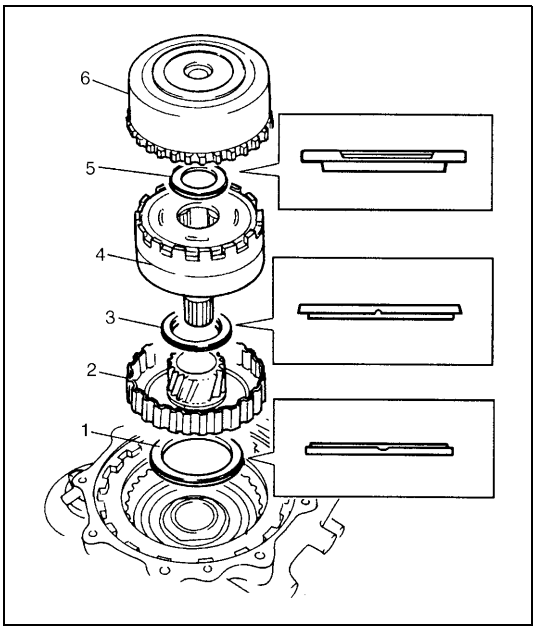
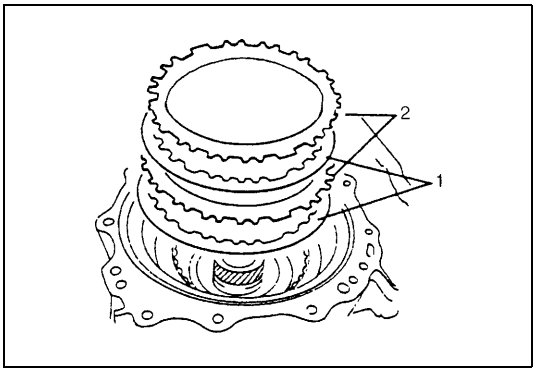


15) Install thrust needle roller bearing (1) and planetary sun gear No.2 (2). Turn planetary sun gear No.2 (2) right and left to match the brake discs and the spline of planetary sun gear No.2.
16) Install thrust needle roller bearing (3) and planetary set (4). Turn planetary set (4) right and left to match the gears of the planetary sun gear No.2 (2) and the gears of the planetary set (4).
17) Install thrust needle roller bearing (5) and planetary sun gear No.1 assembly (6). Turn planetary sun gear No.1 assembly (6) right and left to match the gears of planetary set (4) and the gears of planetary sun gear No.1 assembly (6).



18) Install O/D brake (B0) discs (1) and plates (2).

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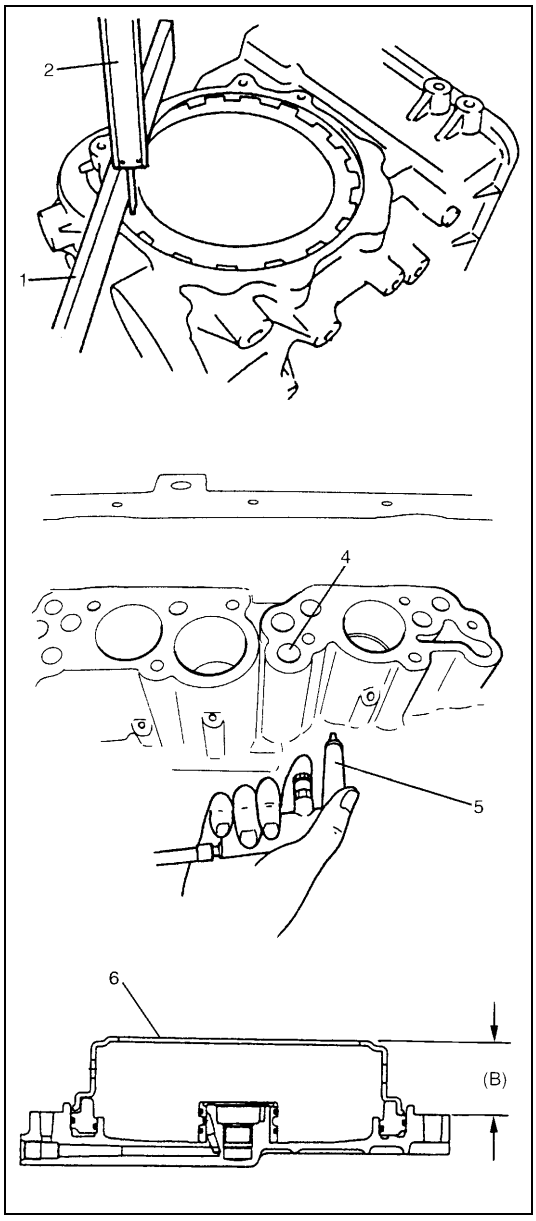
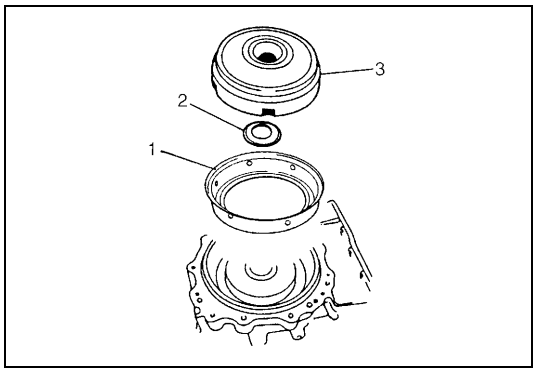


19) Measure the clearance of O/D brake (B0) in the following manner.
- Blow compressed air into hole (4) shown in figure to activate 1st & 2nd brake (B1) piston, then measure the distance between the top of O/D brake (B0) plate and the transmission case – rear cover mating surface.
  Call this value (A).
  ((A) = The value on vernier caliper – width of straight edge)
- Measure the distance from top of O/D brake (B0) piston (on rear cover) to rear cover – transmission case mating surface.
  Call this value (B).
- Clearance = (A) – (B) + 0.4

O/D brake (B0) clearance
Standard : 0.80 – 1.40 mm (0.0315 – 0.0551 in.)

20) If the obtained value is out of standard value, replace brake disc and plate.

1.	Straight edge
2.	Vernier caliper
3.	Rear cover assembly (with B0 piston)
5.	Air gun
6.	O/D brake piston adapter



21) Install O/D brake piston adapter (1) thrust needle roller bearing (2) and direct clutch (C0) assembly (3).

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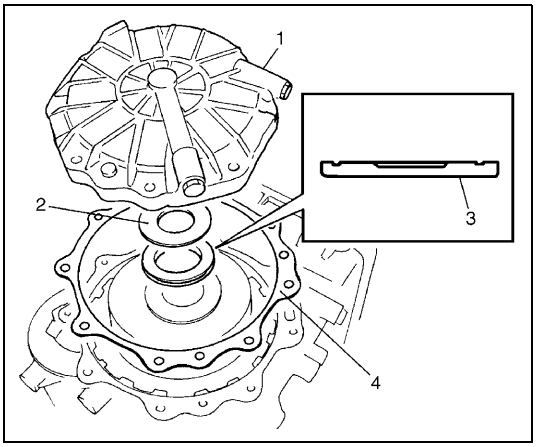
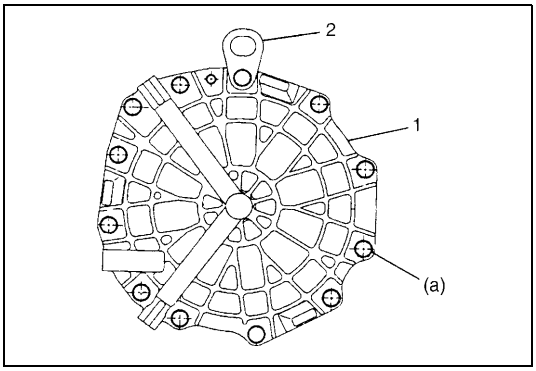


22) Install thrust needle roller bearing (3).
23) Install thrust washer (2).

1.	Rear cover
4.	Gasket(a)

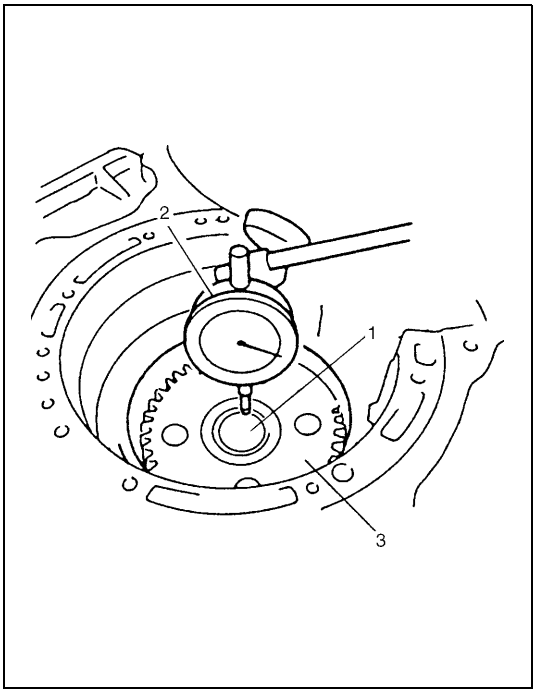


24) Install new gasket to transmission case and install rear cover (1).

Tightening torque
Rear cover bolts
(a) : 19 N·m (1.9 kg-m, 14.0 lb-ft)

NOTE:

Install the hook (2) to the location shown in figure.



25) Measure clearance between thrust washer and rear cover in the following manner.
- Measure the shaft and play of planetary set (1) with dial gauge (2).
  If the obtained clearance is out of specification, select the thrust washer from table below and repeat above steps 22) – 24) to obtain the clearance within specification.

NOTE:

Make sure that tip of dial gauge is not in contact with counter drive gear (3).

Clearance between thrust washer and rear cover
Standard : 0.3 – 0.7 mm (0.012 – 0.028 in.)

Available thrust washer (thickness)
: 1.9 mm (0.075 in.), 2.2 mm (0.087 in.), 2.5 mm (0.098 in.) or 2.8 mm (0.110 in.)

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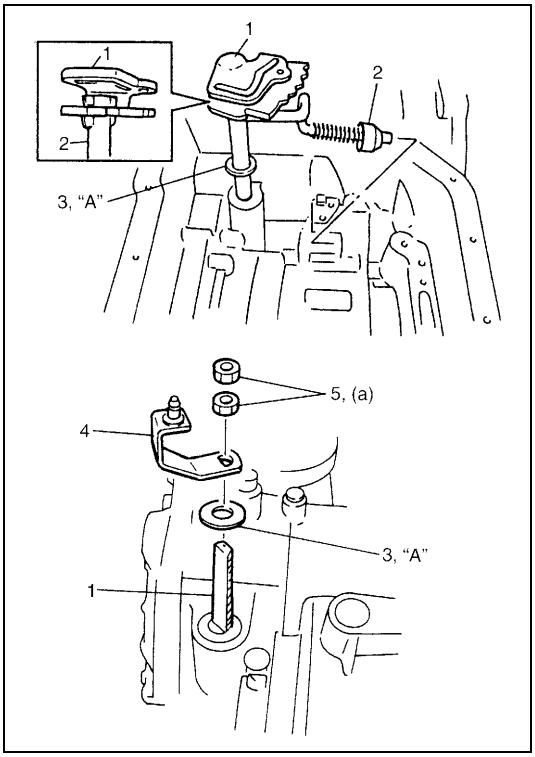
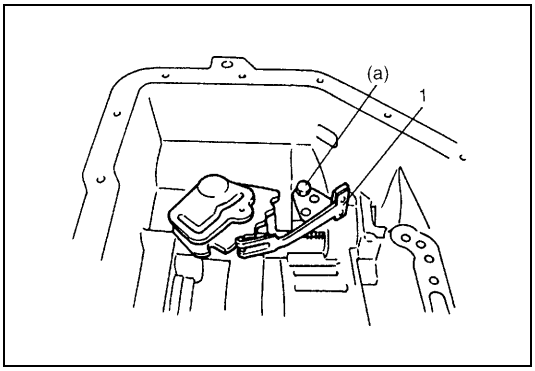


26) Attach parking lock rod (2) to manual shift shaft (1).
27) Install manual shift shaft and washer (3) to transmission case. Fix manual shift shaft with washer, control shift lever (4) and two nuts (5).
Apply grease to the washers.

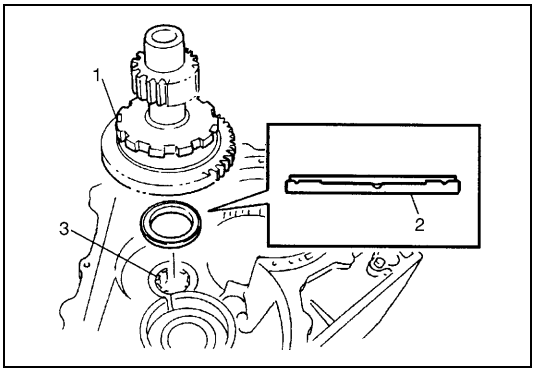
Tightening torque
Control shift lever nuts
(a) : 30 N·m (3.0 kg-m, 22.0 lb-ft)

"A" : Grease 99000-25030

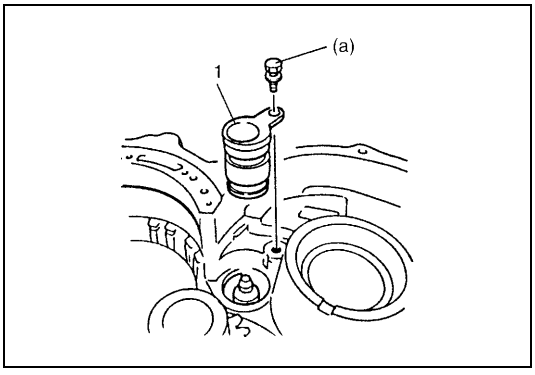


28) Install detent spring (1) to transmission case.

Tightening torque
Detent spring bolt (a) : 11 N·m (1.1 kg-m, 8.0 lb-ft)



29) Install thrust needle roller bearing (2) on counter bearing (3).
30) Install counter driven gear (1).



31) Install parking lock pawl sleeve (1) and oil plate (not shown in figure).

Tightening torque
Parking lock pawl sleeve bolt
(a) : 19 N·m (1.9 kg-m, 14.0 lb-ft)

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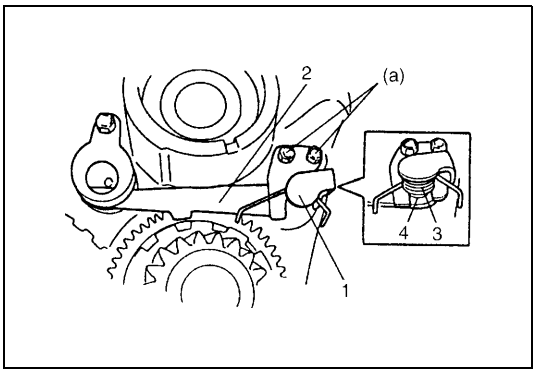
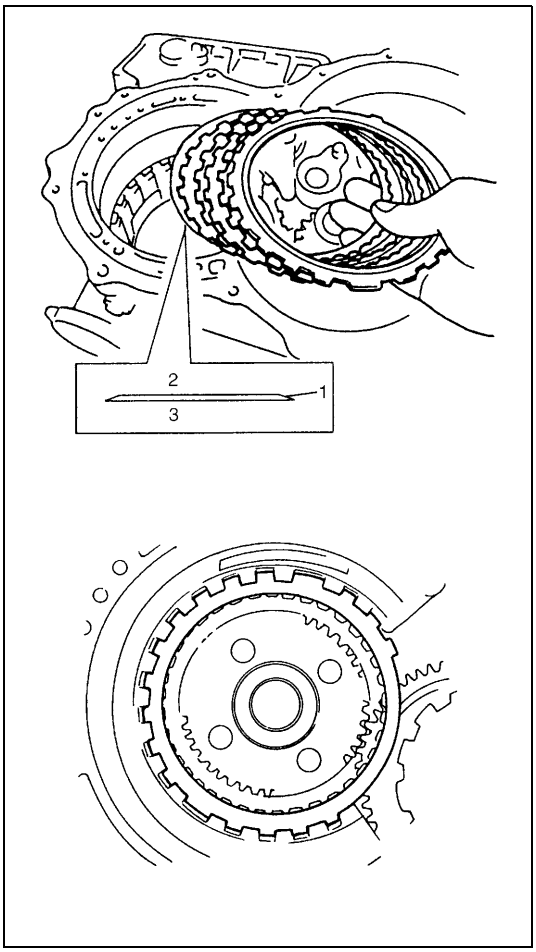


32) Install parking lock pawl (2).
33) Install parking lock pawl shaft (4), torsional spring (3), and cover (1), then hold them with 2 bolts.

Tightening torque
Parking lock pawl bolts (a) : 11 N·m (1.1 kg-m, 8.0 lb-ft)



34) Install reverse brake (B2) plates, discs, flange and cushion plate in following order :
(1) Cushion plate → (2) Plate → (3) Disc → (4) Plate → (5) Disc → (6) Plate → (7) Disc → (8) Plate → (9) Disc → (10) Flange

NOTE:

- **Note the direction of cushion plate (1).**
- **Make sure that the plates are fitted into groove of transmission case as shown in figure.**

35) Hold above parts with snap ring.

2. Brake plate side
3. Transmission case side

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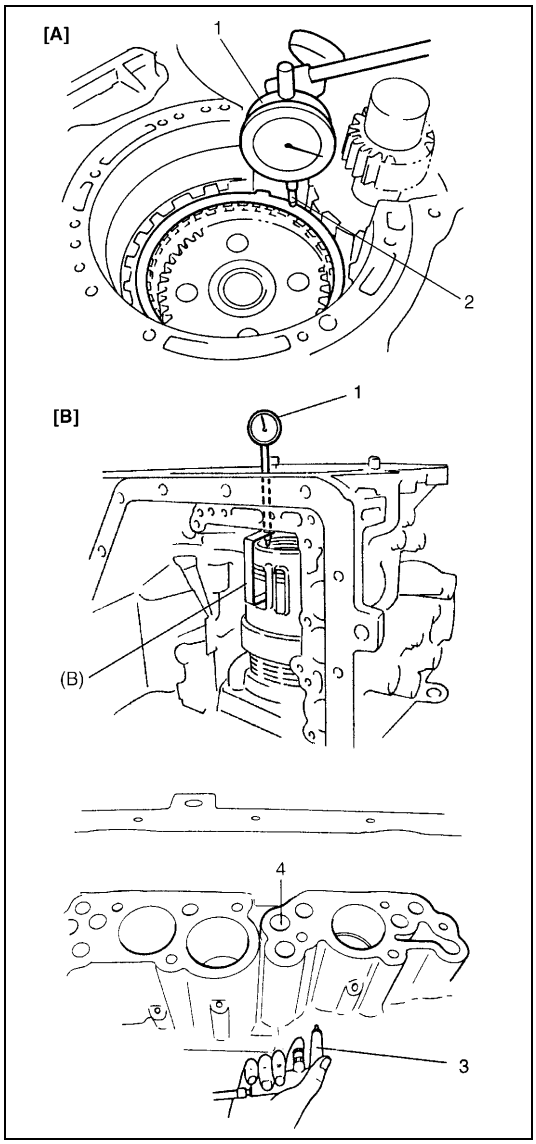


36) Inspect reverse brake (B2) piston stroke and clearance by blowing compressed air into hole (4) shown in figure.
Make sure that the obtained piston stroke and clearance satisfy the standard value.
- Set dial gauge (1) to the top of reverse brake (B2) flange and blow compressed air into the hole shown in figure.

Reverse brake disc clearance
Standard : 0.79 – 1.69 mm (0.031 – 0.067 in.)

- Set special tool (B) on the tip of dial gauge and place the other end of special tool on the claw of reverse brake (B2) piston. Blow compressed air into the hole (4) shown in figure and measure the value for piston stroke.

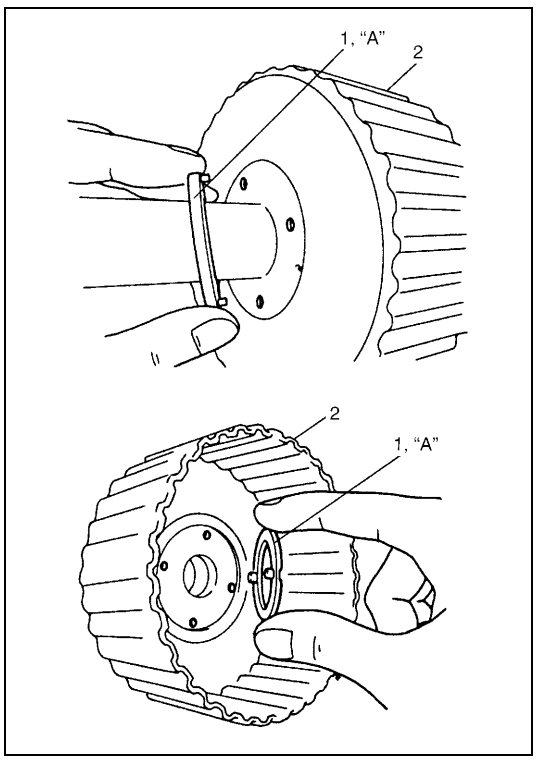
Reverse brake piston stroke
Standard : 1.77 – 2.59 mm (0.070 – 0.102 in.)

Special tool
(B) : 09952-06020

NOTE:

If clearance and/or piston stroke is out of specification, disassemble reverse brake (B2) discs and plates, reinstall them to satisfy the measured values to standard value.

2.	Tip of dial gauge on the top of B2 brake flange
3.	Air gun
[A] :	Clearance
[B] :	Piston Stroke



37) Apply grease to thrust washers (1) and install them to follow shaft (2).

NOTE:

When installing thrust washers, make sure that the protrusions of thrust washer do not interfere with the ones of the other side.

"A" : Grease 99000-25030

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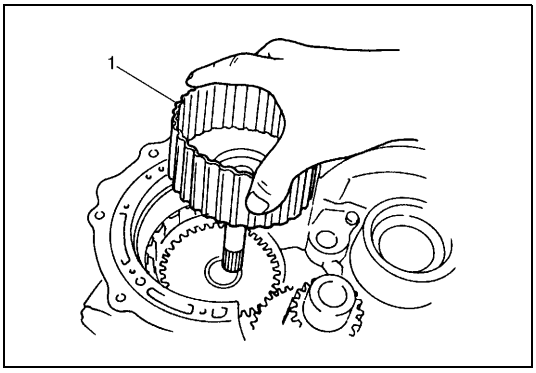
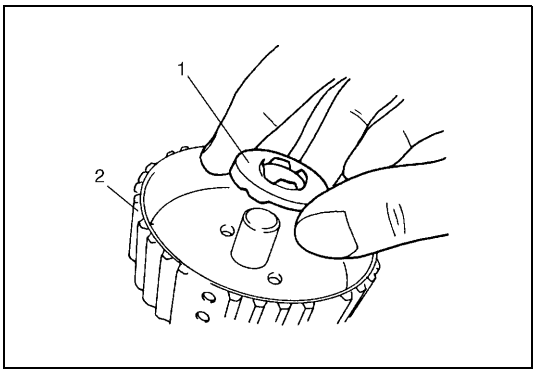


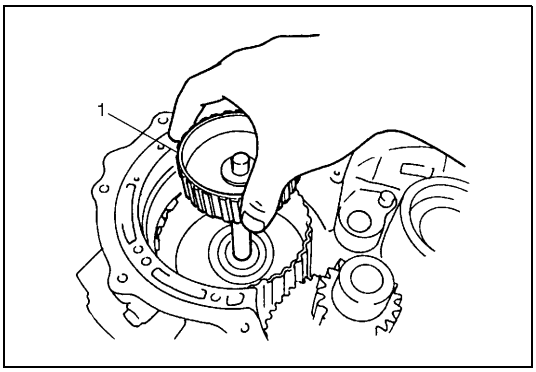
38) Install follow shaft (1) to transmission case.
Turn it right and left to match the reverse brake (B2) discs and the spline of follow shaft.

NOTE:

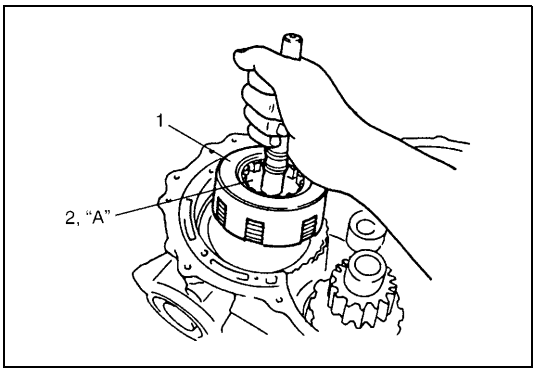
When installing follow shaft, do not let the thrust washer fall off from follow shaft.



39) Install thrust needle roller bearing (1) to intermediate shaft (2).

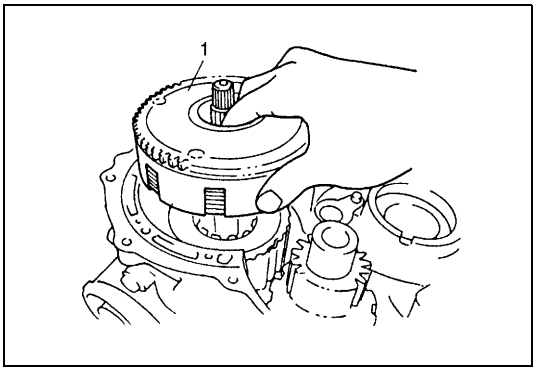


40) Install intermediate shaft (1) to transmission case.



41) Install rear clutch assembly (1) by turning it right and left to match the clutch disc of rear clutch assembly and the spline of intermediate shaft.
42) Install thrust bearing race (2).

"A" : Grease 99000-25030



43) Install front clutch assembly (1) by turning it right and left to match the clutch of disc clutch assembly and the spline of follow shaft.

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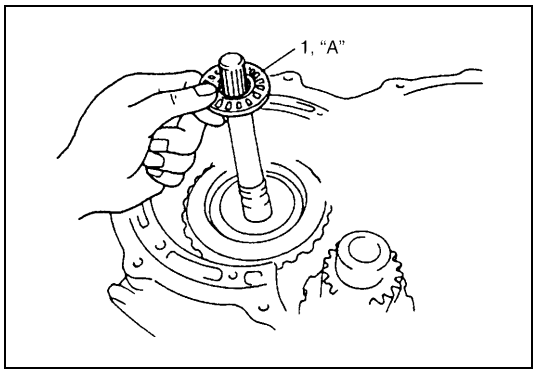
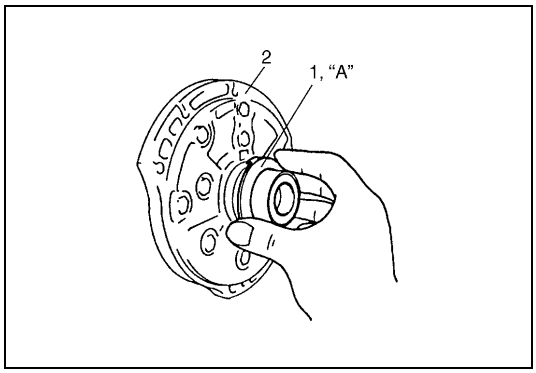


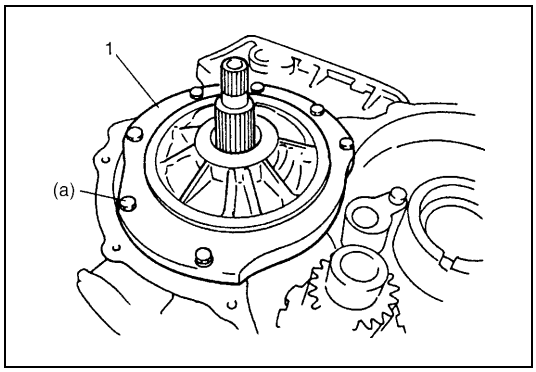
44) Apply grease to thrust needle roller bearing (1) and install it.

"A" : Grease 99000-25030



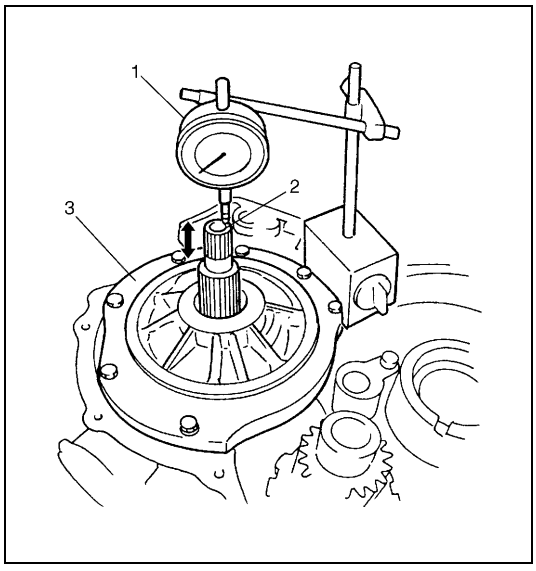
45) Apply grease to clutch drum thrust washer (1) and install it to oil pump assembly (2).

"A" : Grease 99000-25030



46) Install new gasket to transmission case and install oil pump assembly (1) to transmission case.

Tightening torque
Oil pump assembly bolts (a) : 12 N·m (1.2 kg-m, 9.0 lb-ft)



47) Measure input shaft end (2) play.
Set dial gauge (1) as shown in figure and measure the play of the input shaft.

Input shaft end Play
Standard : 0.3 – 0.7 mm (0.012 – 0.028 in.)

48) If the obtained value is out of standard value, select thrust bearing race (installed in step 41)) of different thickness shown in table below and adjust the play.

Available thrust bearing race size (thickness)
1.3 mm (0.051 in.), 1.7 mm (0.067 in.) or 2.1 mm (0.083 in.)

3. Oil pump

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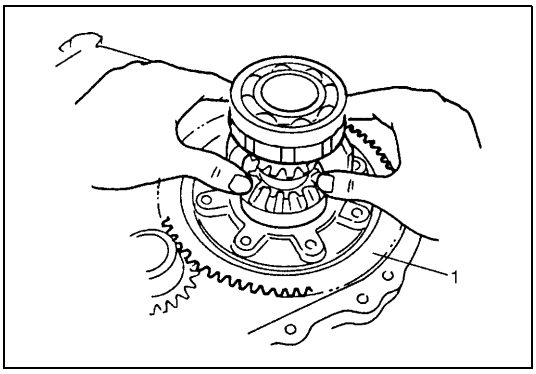
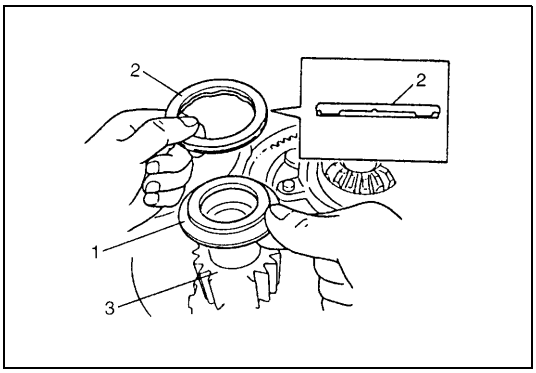


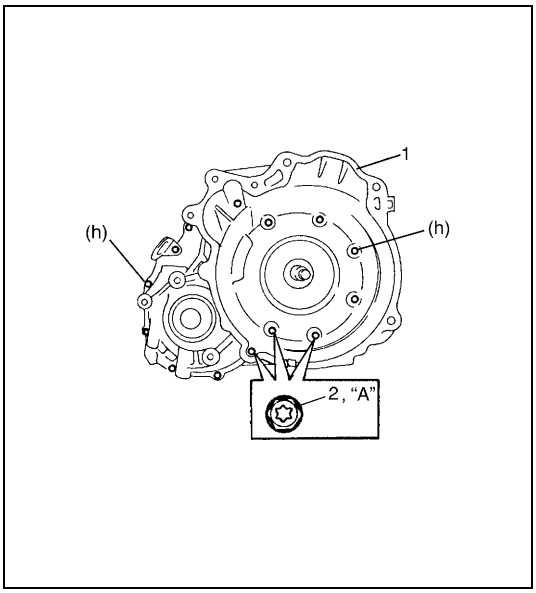
49) Install differential gear assembly (1).

NOTE:

Grease can be applied around the R and L bearing of differential gear assembly to ease fitting to the transmission case and torque converter housing.



50) Install thrust bearing race (1) and thrust needle roller bearing (2) to the top of counter driven gear (3).



51) Apply grease to oil pump D-ring.
Install new gasket to transmission case and install torque converter housing (1).

Tightening torque
Torque converter housing bolts
(h) : 19 N·m (1.9 kg-m, 14.0 lb-ft)

Grease 99000-25030

NOTE:

Apply thread lock to the three bolts shown in figure.

"A" : Thread lock cement 99000-32110

2. New bolt

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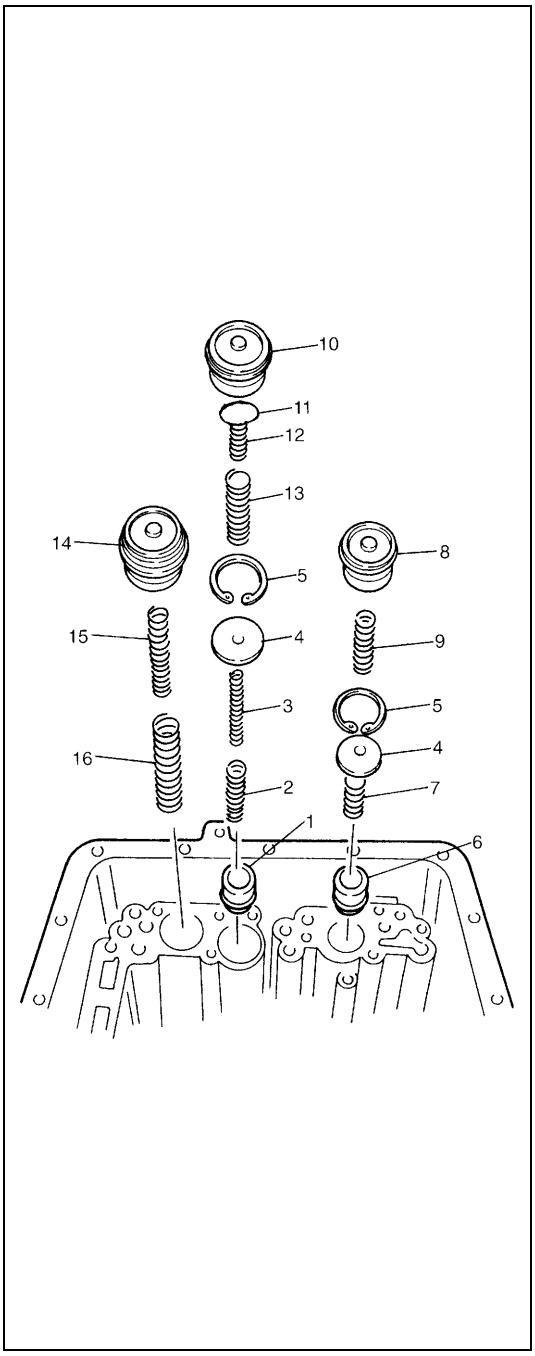


52) Install O-rings to each accumulator piston and apply grease or ATF to them.

Grease 99000-25030

NOTE:

C1 and B0 accumulator pistons are the same.

53) Install C1 and B0 accumulator pistons (1 and 6), springs (2, 3 and 7) and spacers (4).
Hold them with snap rings (5).

NOTE:

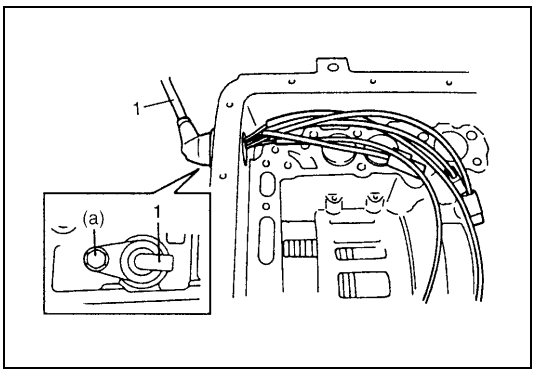
- **Make sure that snap rings are fitted to the groove of each cylinder.**
- **Make sure that O-rings are not twisted or caught when installing.**

54) Install C0, B1, C2 accumulator springs (9, 12, 13, 15 and 16), spacer (11) and pistons (8, 10 and 14) as shown in figure.

NOTE:

Make sure that O-rings are not twisted or caught when installing.

1. C1 accumulator piston	9. C0 accumulator spring (with Pink paint)
2. C1 accumulator outer spring (with Yellow paint)	10. B1 accumulator piston
3. C1 accumulator inner spring (with Yellow paint)	11. B1 accumulator spacer
4. Spacer	12. B1 accumulator inner spring (with Orange paint)
5. Snap ring	13. B1 accumulator outer spring (with Orange paint)
6. B0 accumulator piston	14. C2 accumulator piston
7. B0 accumulator spring (with Purple paint)	15. C2 accumulator inner spring (with Light Blue paint)
8. C0 accumulator piston	16. C2 accumulator outer spring (with Light Blue paint)



55) Install wire-to-solenoid assembly (1).

NOTE:

Apply grease to O-ring of wire-to-solenoid assembly.

Tightening torque
Wire - to - solenoid assembly bolt
(a) : 8 N·m (0.8 kg-m, 6.0 lb-ft)

Grease 99000-25030

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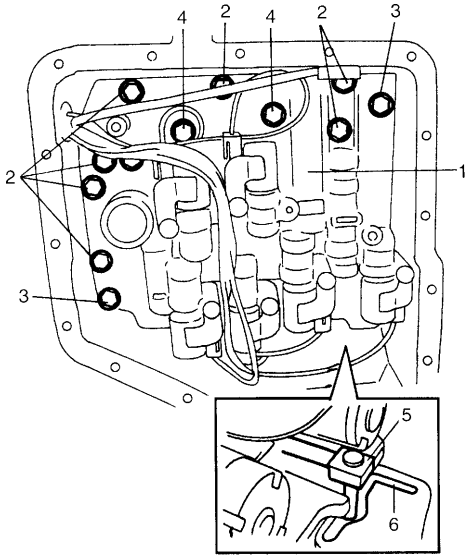
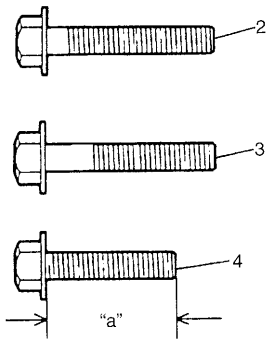


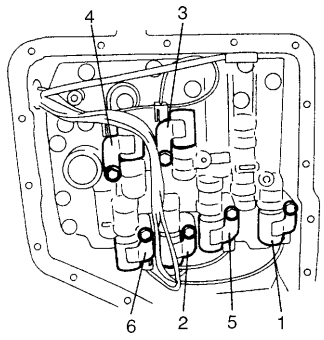


56) Install valve body assembly (1) to transmission case.
First match the pin of the manual valve to the slot of the manual shift shaft.
To fix valve body assembly (1) to transmission case, first tighten bolt B (3), then tighten other bolts.

Tightening torque
Valve body to transmission case bolts
: 10 N·m (1.0 kg-m, 7.5 lb-ft)

Bolt	Length "a"	Pieces
A	30 mm (1.20 in.)	7
B	31 mm (1.22 in.)	2
C	25 mm (0.98 in.)	2

2.	Bolt A
4.	Bolt C
5.	Manual valve pin
6.	Slot of manual shift shaft



57) Connect couplers of wire-to-solenoid to solenoid valves.

Solenoid Valve	Wire Color
A (No.1)	White
B (No.2)	Black
C (No.3)	Red
D (No.4)	Yellow
E (No.5)	Brown
TCC (Lock-up)	Orange

1.	Solenoid valve No.1
2.	Solenoid valve No.2
3.	Solenoid valve No.3
4.	Solenoid valve No.4
5.	Solenoid valve No.5
6.	Lock-up solenoid

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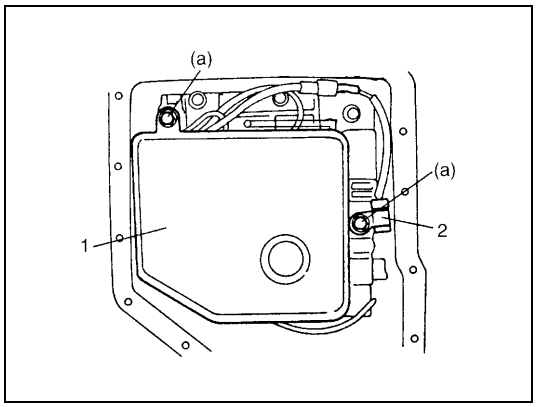
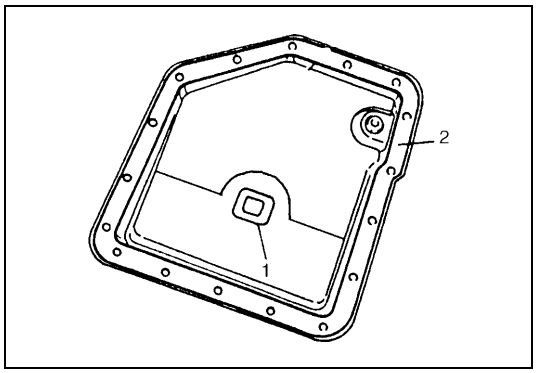


58) Install O-ring to oil strainer assembly (1). Make sure that O-ring is not twisted.
59) Install oil strainer assembly to the top of valve body assembly.
Connect transmission temperature sensor (2) coupler.
Fix transmission temperature sensor and oil strainer assembly with bolts.

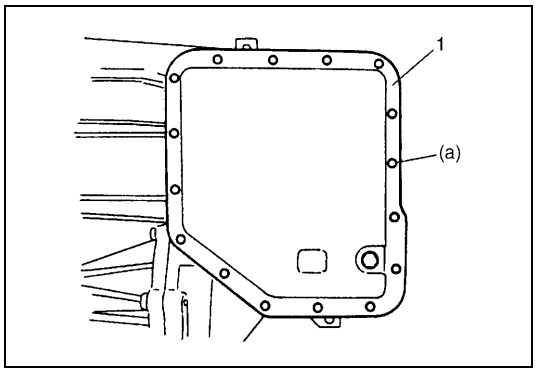
Tightening torque
Transmission temperature sensor bolt
(a) : 10 N·m (1.0 kg-m, 7.5 lb-ft)



60) Install magnet (1) in oil pan (2).

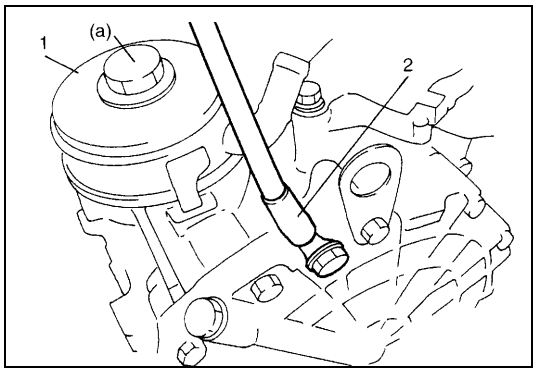
NOTE:

If metal particles are attached to the magnet, clean them before installing.



61) Install gasket to transmission case and install oil pan (1).

Tightening torque
A/T oil pan bolts (a) : 7.5 N·m (0.75 kg-m, 5.5 lb-ft)



62) Install oil cooler (1) and ground cable (2).

Tightening torque
A/T oil cooler bolt (a): 60 N·m (6.0 kg-m, 43.5 lb-ft)

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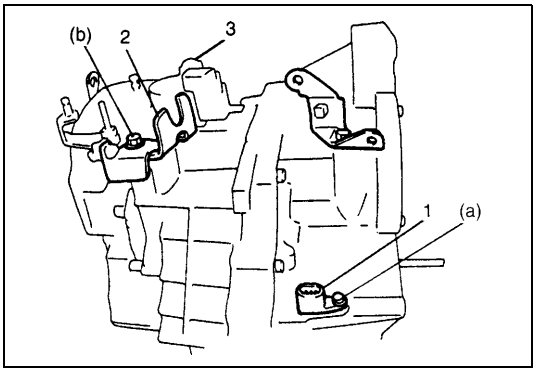
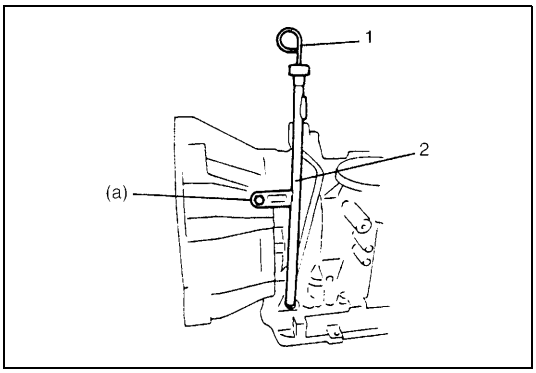


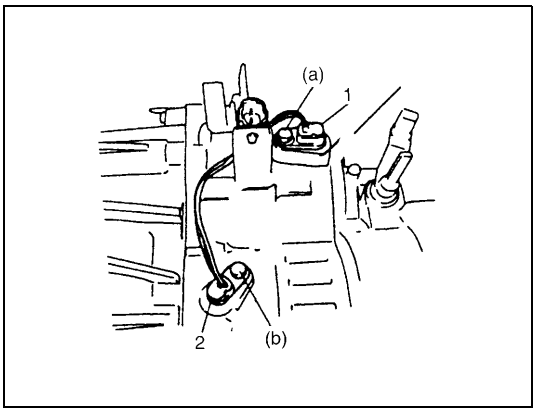
63) Install vehicle speed sensor (for speedometer) (1), shift cable bracket (2) and connector clamp bracket (3).

Tightening torque
Vehicle speed sensor bolt
(a) : 5.5 N·m (0.55 kg-m, 4.0 lb-ft)
Shift cable bracket bolts
(b) : 13 N·m (1.3 kg-m, 9.5 lb-ft)
Connector clamp bracket bolt : 8 N·m (0.8 kg-m, 6.0 lb-ft)



64) Install A/T fluid filler tube (2) and level gauge (1).

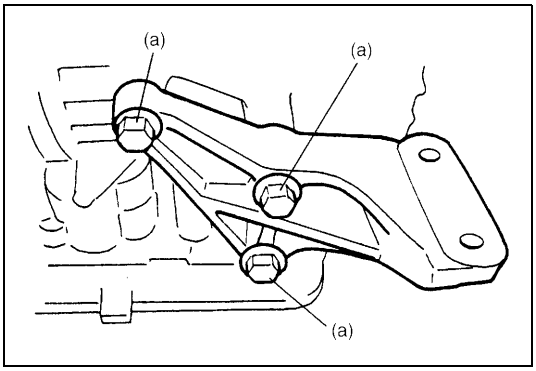
Tightening torque
A/T fluid filler tube bolt (a) : 19.5 N·m (1.95 kg-m, 14.5 lb-ft)



65) Install output shaft speed sensor (1) and input shaft speed sensor (2).
Apply grease to O-ring of each sensor.

Tightening torque
Output shaft speed sensor bolt
(a) : 8 N·m (0.8 kg-m, 6.0 lb-ft)
Input shaft speed sensor bolt
(b) : 8 N·m (0.8 kg-m, 6.0 lb-ft)

Grease : 99000-25030



66) Install engine mounting LH bracket.

Tightening torque
Engine mounting LH bracket bolts
(a) : 55 N·m (5.5 kg-m, 40.0 lb-ft)

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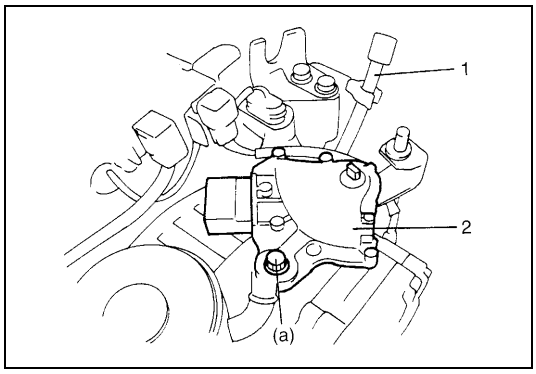
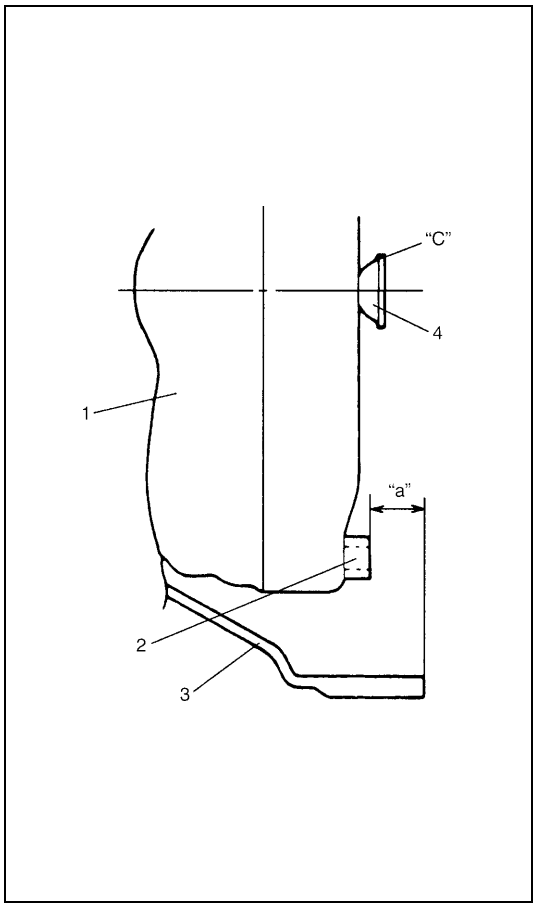


67) Install breather sensor hose (1).
68) Install transmission range sensor (2).
Install it temporarily so that the adjustment can be done after installing assembly back to the vehicle.

Tightening torque
Transmission range sensor bolt
(a) : 18 N·m (1.8 kg-m, 13.0 lb-ft)



69) Install torque converter (1) to input shaft.
- Install torque converter, using care not to damage oil seal of oil pump.
- After installing torque converter, check to make sure that distance "a" is within specification.

Torque converter installing position
"a" : More than 19.9 mm (0.783 in.)

- Check torque converter for smooth rotation.
- Apply grease around cup at the center of torque converter.

"C" : Grease 99000-25010

CAUTION:
- **Before installing converter, make sure that its pump hub portion is free from nicks, burrs or damage which may cause oil seal to leak.**
- **Be very careful not to drop converter on oil pump gear. Damage in gear, should it occur, may cause a critical trouble.**

2.	Flange nut
3.	Torque converter housing
4.	Cup

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TIGHTENING TORQUE SPECIFICATION

Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
A/T fluid drain plug	23	2.3	16.5
Transmission rage sensor bolt	18	1.8	13.0
Output shaft speed sensor bolt	8	0.8	6.0
Input shaft speed sensor bolt	8	0.8	6.0
Dropping resistor bolts	20	2.0	14.5
Shift solenoid bolts	8	0.8	6.0
Transmission temperature sensor bolt	10	1.0	7.5
Transmission to engine bolts and nut	85	8.5	61.5
Drive plate to torque converter bolts	20	2.0	14.5
Starter motor bolts	23	2.3	16.5
Oil pump cover bolts	10	1.0	7.5
Valve body bolts	5.5	0.55	4.0
Final gear bolts	90	9.0	65.0
Counter drive gear installing bolts	5.5	0.55	4.0
Rear cover bolts	19	1.9	14.0
Control shift lever nuts	30	3.0	22.0
Detent spring bolt	11	1.1	8.0
Parking lock pawl sleeve bolt	19	1.9	14.0
Parking lock pawl bolts	11	1.1	8.0
Oil pump assembly bolts	12	1.2	9.0
Torque converter housing bolts	19	1.9	14.0
Wire-to-solenoid assembly bolt	8	0.8	6.0
Valve body to transmission case bolts	10	1.0	7.5
A/T oil pan bolts	7.5	0.75	5.5
A/T oil cooler bolt	60	6.0	43.5
Vehicle speed sensor bolt	5.5	0.55	4.0
Shift cable bracket bolt	13	1.3	9.5
Connector clamp bracket bolt	8	0.8	6.0
A/T fluid filler tube bolt	19.5	1.95	14.5
Engine mounting LH bracket bolts	55	5.5	40.0

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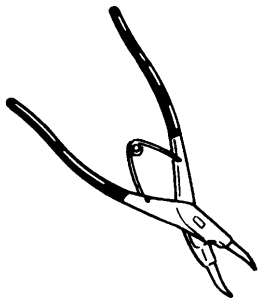
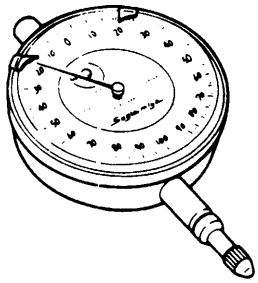
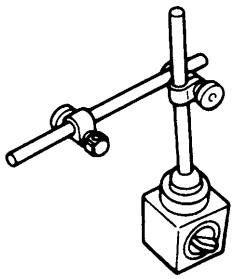
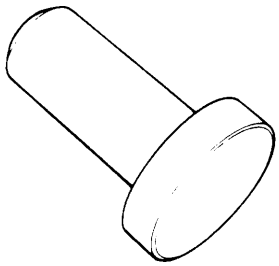
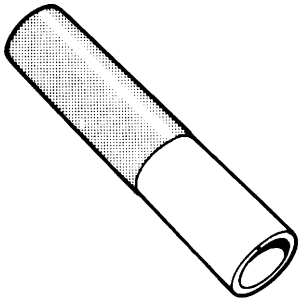
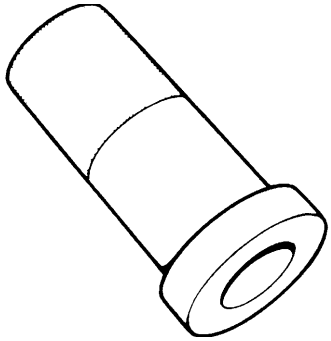
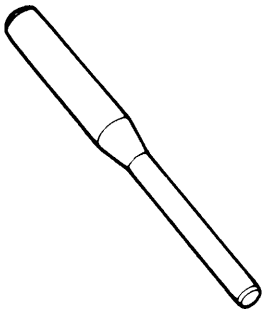
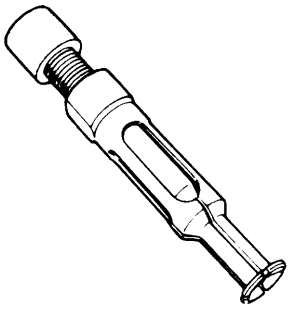
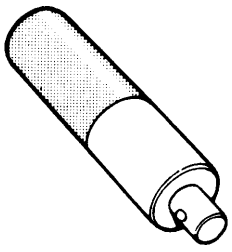
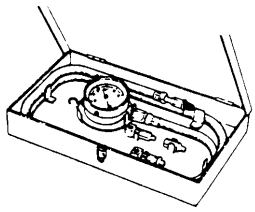
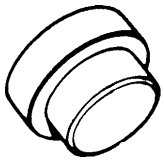
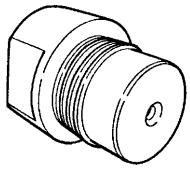
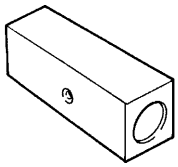
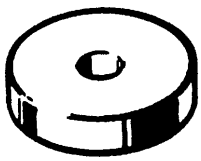
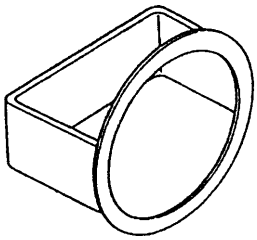
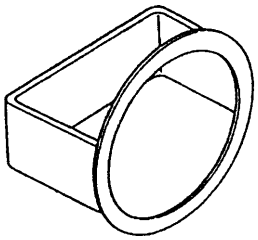
SPECIAL TOOL

 09900-06108 Snap ring plier (Closing type)	 09900-20606 Dial gauge	 09900-20701 Magnetic stand	 09913-75510 Bearing installer
 09913-80112 Bearing installer	 09913-85210 Bearing installer	 9922-85811 Spring pin remover (6 mm)	 09923-74510 Bearing remover
 09924-74510 Installer handle	 09925-37811-001 Oil pressure gauge	 09925-88210 Bearing puller attachment	 09926-26030 Air installer No.1
 09926-26040 Air installer No.2	 09926-68310 Bearing installer	 09926-96010 Clutch spring compressor	 09926-96020 Clutch spring compressor

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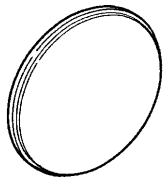
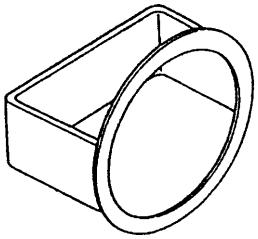
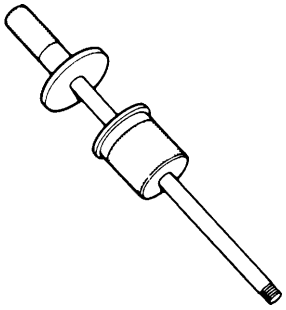
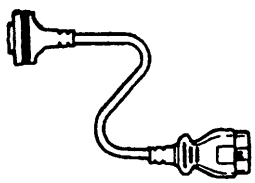
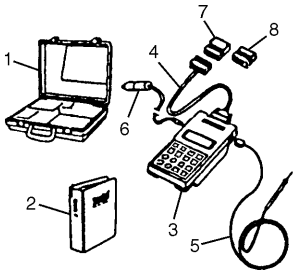
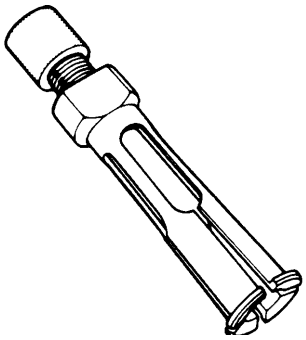
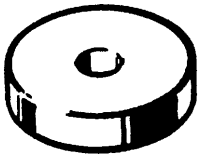
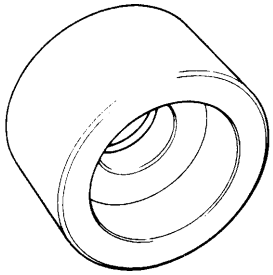
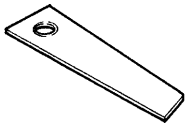
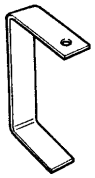
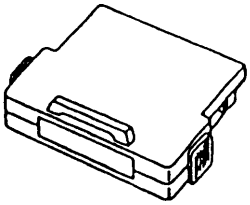
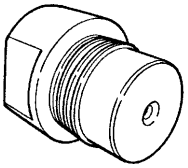
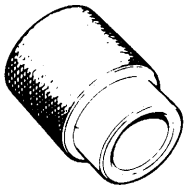
 09926-96030 Clutch spring compressor No.7	 09926-96040 Clutch spring compressor No.8	 09930-30102 Sliding shaft	 09931-76030 16/14 pin DLC adapter
 09931-76011 Tech 1A kit See NOTE below.	 09941-64511 Bearing remover	 09944-68510 Bearing installer	 09951-16060 Bush remover
 09952-06010 Dial gauge plate No.1	 09952-06020 Dial gauge plate No.2	 Mass storage cartridge	 09926-26050 Air installer No.3
 09940-53111 Oil seal install tool			

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NOTE:

This kit includes the following items.

1. Storage case, 2. Operator's manual, 3. SUZUKI scan tool (Tech-1A), 4. DLC cable, 5. Test lead / probe, 6. Power source cable, 7. DLC cable adaptor, 8. Self-test adaptor

REQUIRED SERVICE MATERIAL

Material	Recommended SUZUKI product (Part Number)	Use
Automatic transmission fluid	An equivalent of DEXRON®-III or DEXRONR®-IIE	• Automatic transmission • Parts lubrication when installing
Sealant	SUZUKI BOND No. 1215 (99000-31110)	• Case housing star-shaped recess bolts (3 pcs only)
Lithium grease	SUZUKI SUPER GREASE C (99000-25030)	• Retaining parts in place when assembling • Oil seal lips • D-rings • O-rings
	SUZUKI SUPER GREASE A (99000-25010)	• Cable ends • Converter center cup
Thread lock cement	THREAD LOCK 1322 (99000-32110)	• Final gear bolts • Torque converter housing bolts

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SECTION 7C

CLUTCH

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

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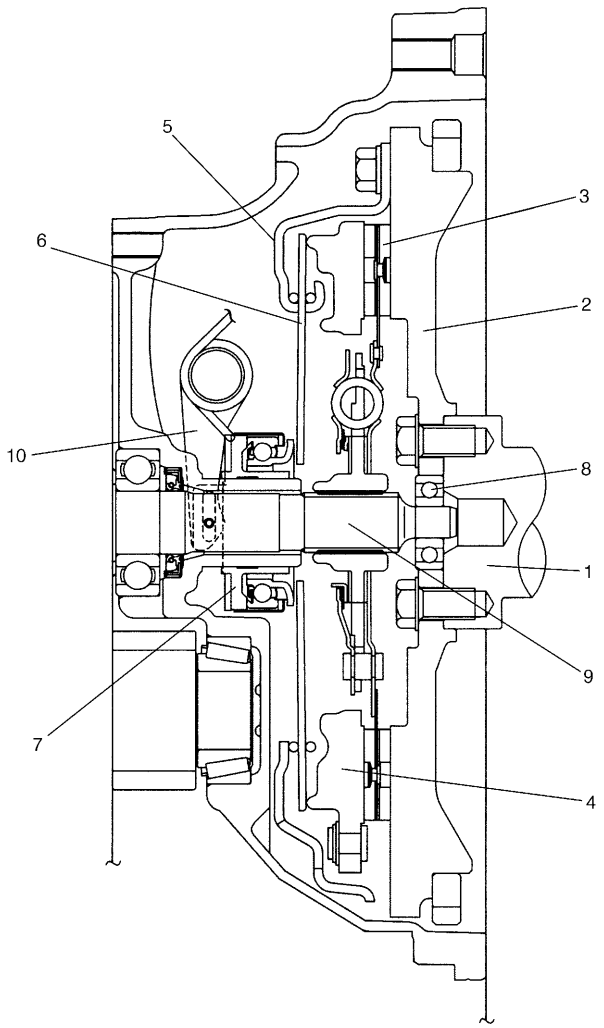
GENERAL DESCRIPTION

The clutch is a diaphragm-spring clutch of a dry single disc type. The diaphragm spring is of a tapering-finger type, which is a solid ring in the outer diameter part, with a series of tapered fingers pointing inward.

The disc, carrying four torsional coil springs, is positioned on the transmission input shaft with an involute spline fit.

The clutch cover is secured to the flywheel, and carries the diaphragm spring in such a way that the peripheral edge part of the spring pushes on the pressure plate against the flywheel (with the disc in between), when the clutch release bearing is held back. This is the engaged condition of the clutch.
Depressing the clutch pedal causes the release bearing to advance and pushes on the tips of the tapered fingers of the diaphragm spring. When this happens, the diaphragm spring pulls the pressure plate away from the flywheel, thereby interrupting the flow of drive from flywheel through clutch disc to transmission input shaft.



1. Crankshaft	6. Diaphragm spring
2. Flywheel	7. Release bearing
3. Clutch disc	8. Input shaft bearing
4. Pressure plate	9. Input shaft
5. Clutch cover	10. Release shaft

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DIAGNOSIS

Condition	Possible Cause	Correction
Slipping	Improper clutch pedal free travel	Adjust free travel.
	Worn or oily clutch disc facing	Replace disc.
	Warped disc, pressure plate or flywheel surface	Replace disc, clutch cover or flywheel.
	Weakened diaphragm spring	Replace clutch cover.
	Rusted clutch cable	Replace cable.
Dragging clutch	Improper clutch pedal free travel	Adjust free travel.
	Weakened diaphragm spring, or worn spring tip	Replace clutch cover.
	Rusted input shaft splines	Lubricate.
	Damaged or worn splines of transmission input shaft	Replace input shaft.
	Excessively wobbly clutch disc	Replace disc.
	Clutch facings broken or dirty with oil	Replace disc.
Clutch vibration	Glazed (glass-like) clutch facings	Repair or replace disc.
	Clutch facings dirty with oil	Replace disc.
	Release bearing slides unsmoothly on input shaft bearing retainer	Lubricate or replace input shaft bearing retainer.
	Wobbly clutch disc, or poor facing contact	Replace disc.
	Weakened torsion springs in clutch disc	Replace disc.
	Clutch disc rivets loose	Replace disc.
	Distorted pressure plate or flywheel surface	Replace clutch cover or flywheel.
	Weakened engine mounting or loosened engine mounting bolt or nut	Retighten or replace mounting.
Noisy clutch	Worn or broken release bearing	Replace release bearing.
	Input shaft front bearing worn down	Replace input shaft bearing.
	Excessive rattle of clutch disc hub	Replace disc.
	Cracked clutch disc	Replace disc.
	Pressure plate and diaphragm spring rattling	Replace clutch cover.
Grabbing clutch	Clutch disc facings soaked with oil	Replace disc.
	Clutch disc facings excessively worn	Replace disc.
	Rivet heads showing out of facing	Replace disc.
	Weakened torsion springs	Replace disc.

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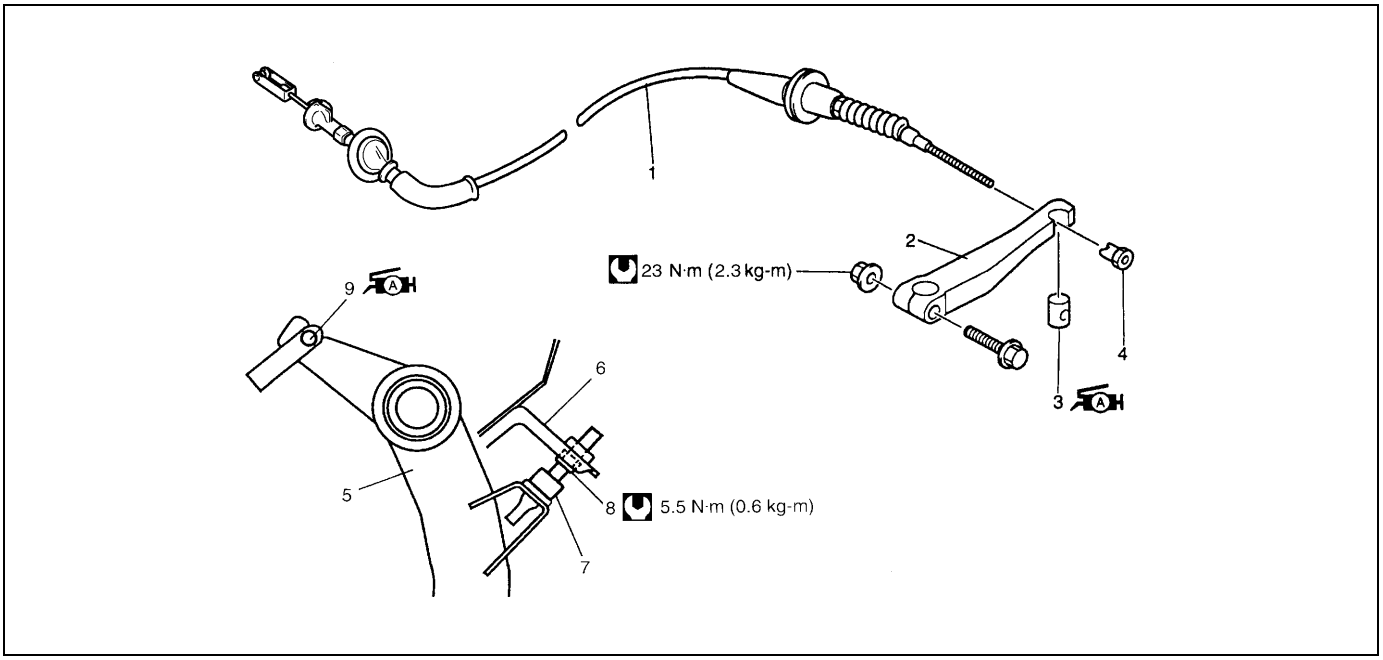
ON-VEHICLE SERVICE

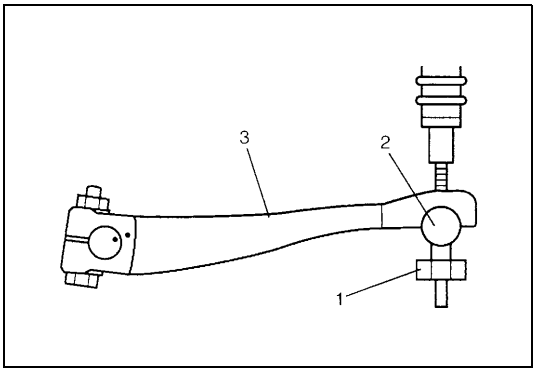
CLUTCH CABLE



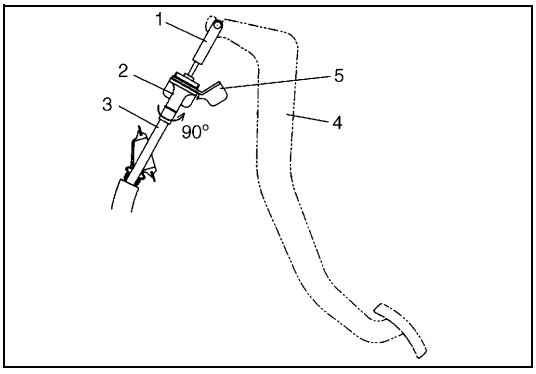
	1. Clutch cable		6. Pedal bracket
	2. Release lever		7. Adjusting bolt
A	3. Joint pin : Apply grease 99000-25010 to joint pin.		8. Lock nut
	4. Joint nut	A	9. Clutch cable hook : Apply grease 99000-25010 to cable hook.
	5. Clutch pedal		Tightening torque

REMOVAL

1) Disconnect negative cable at battery.



2) Remove clutch cable joint nut (1).
3) Remove joint pin (2) from clutch release lever (3).



4) Disconnect cable hook (1) from clutch pedal (4).
5) Remove clutch cable (3) from bracket (5) by turning cable cap (2) about 90° as shown.

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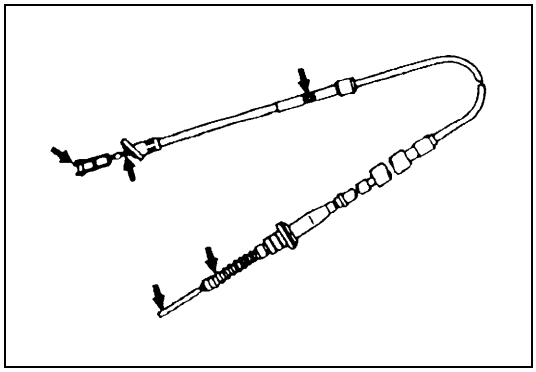
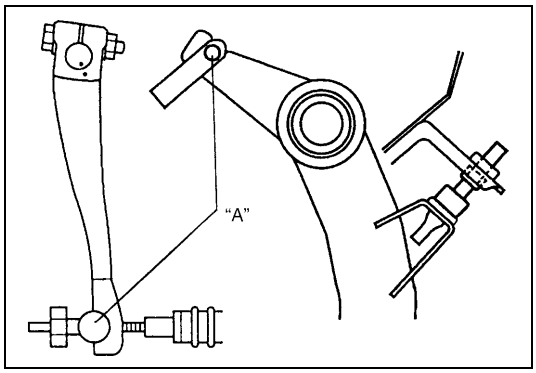
INSPECTION



Inspect clutch cable and replace it for any of the following conditions.

- Excessive cable friction
- Frayed cable
- Bent or kinked cable
- Broken boots
- Worn end

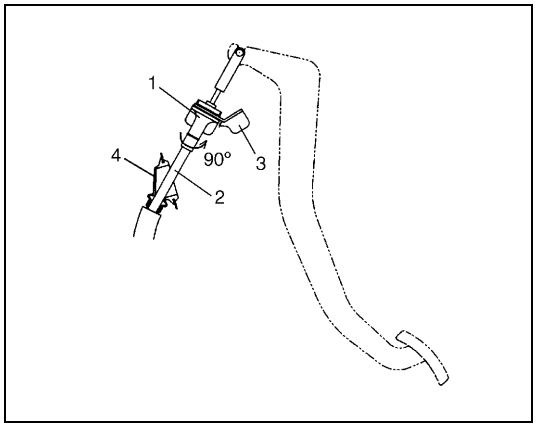
INSTALLATION



1) Apply grease to cable end hook and also joint pin before installing cable.

"A" : Grease 99000-25010

2) Hook cable end with pedal by using screwdriver or long nose pliers from cabin inside, then join inner cable wire joint pin in release lever.



3) Install clutch cable (2) to bracket (3) by turning cable cap (1) about 90° as shown.
4) Screw in joint nut and adjust free travel of pedal to specification by turning nut.
5) Check clutch for proper function with engine running.

NOTE:

Take care that cable grommet (4) has specific installing direction as shown in the figure.

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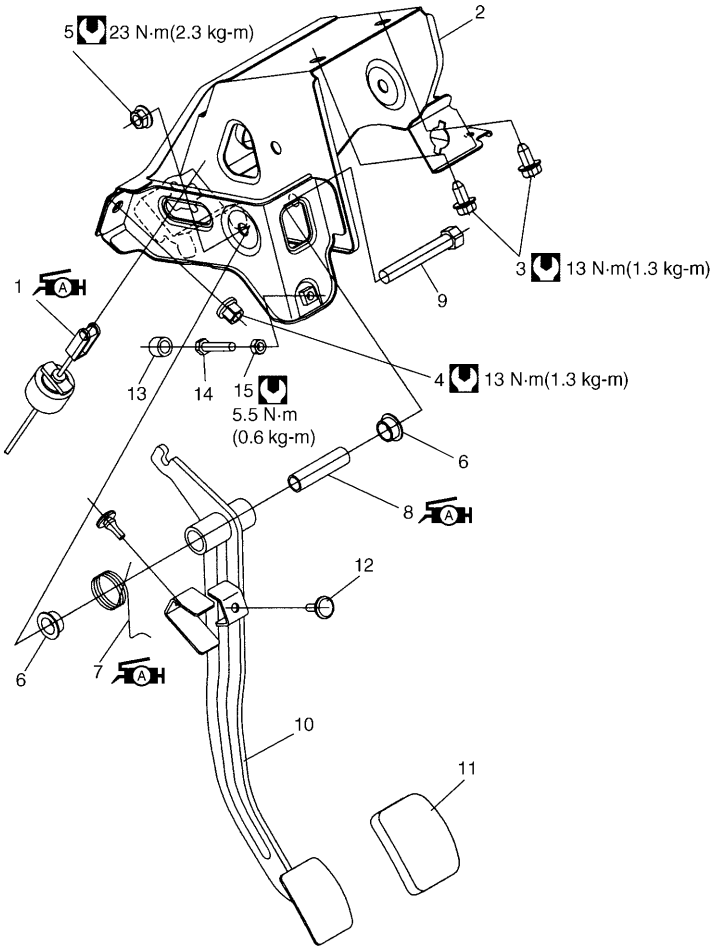
CLUTCH PEDAL AND CLUTCH PEDAL BRACKET



A H	1. Clutch cable hook : Apply grease 99000-25010 to cable hook.	A H	7. Pedal spring : Apply grease 99000-25010 to inside surface of spring.	13. Adjusting bolt cap	
	2. Clutch pedal bracket	A H	8. Pedal shaft spacer : Apply grease 99000-25010 to outside surface of spacer.	14. Adjusting bolt	
	3. Bolt		9. Pedal shaft	15. Lock nut	
	4. Nut		10. Clutch pedal		Tightening torque
	5. Pedal shaft nut		11. Pedal pad		
	6. Pedal bush		12. Pedal return cushion		

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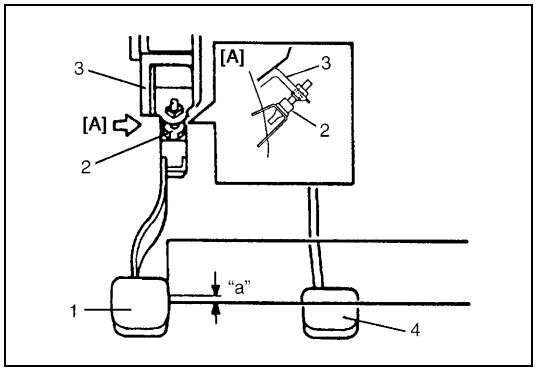
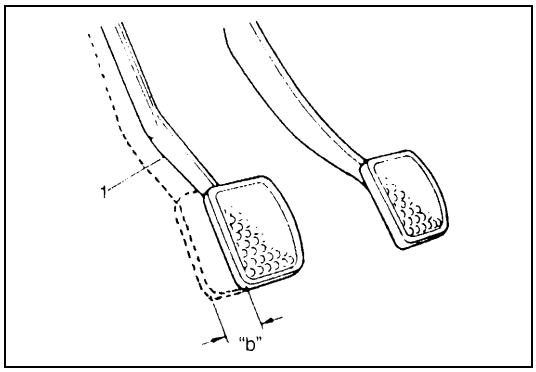
CLUTCH PEDAL HEIGHT



Adjust clutch pedal (1) height with adjusting bolt (2) located on pedal bracket (3) so that clutch pedal height is same as brake pedal (4) height.

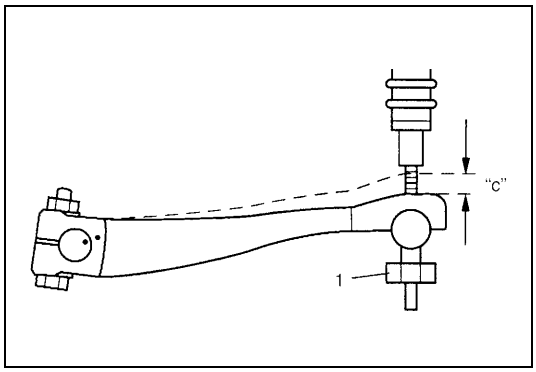
Height difference
"a" : 0 mm (0 in.)

CLUTCH PEDAL FREE TRAVEL



1) Confirm that clutch pedal height is specification.
2) Depress clutch pedal (1), stop the moment clutch resistance is felt, and measure distance (clutch pedal free travel). Free travel should be within the following specification.

Pedal free travel
"b" : 15 – 20 mm (0.6 – 0.8 in.)



3) If free travel is out of specification, adjust it with cable joint nut (1).

Release lever free travel (Reference)
"c" : 0 – 2 mm (0 – 0.08 in.)

4) After checking clutch pedal free travel, also check clutch for proper function with engine running.

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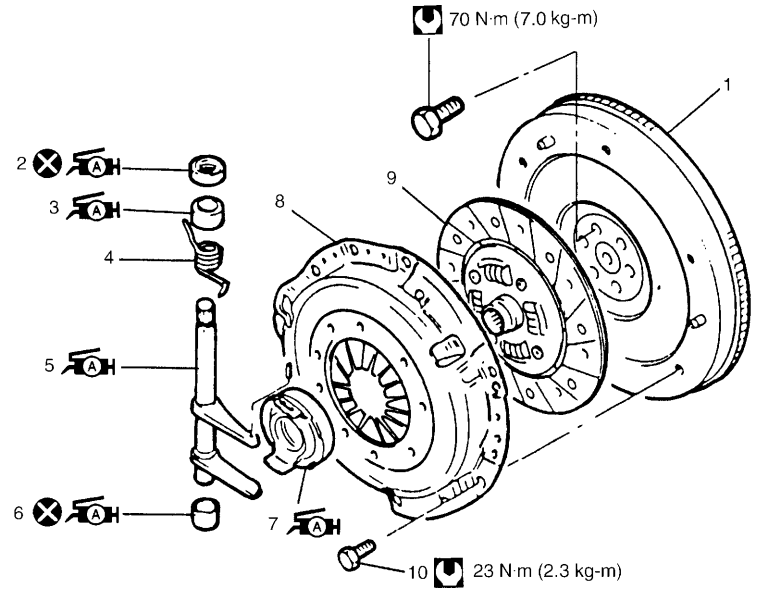
UNIT REPAIR OVERHAUL

CLUTCH COVER, CLUTCH DISC AND FLYWHEEL



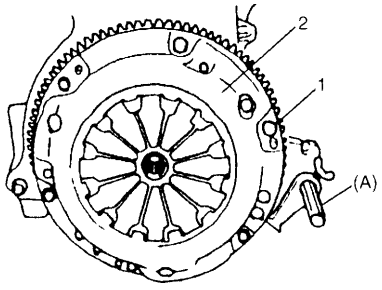
	1. Flywheel		7. Release bearing : Apply grease 99000-25010 to joint of bearing and release shaft and also bearing inside. (0.3 g)
	2. Clutch release shaft seal : Apply grease 99000-25010 to seal lip. (0.3 g)		8. Clutch cover
	3. Clutch release shaft No.2 bush : Apply grease 99000-25010 to bush inside. (0.3 g)		9. Clutch disc
	4. Return spring		10. Clutch cover bolt
	5. Clutch release shaft Apply grease 99000-25010 to the end of release shaft arm. (0.3 g)		Tightening torque
	6. Clutch release shaft No.1 bush : Apply grease 99000-25010 to bush inside. (0.3 g)		Do not reuse.

REMOVAL

1) Dismount transmission assembly referring to Section 7A.

2) Hold flywheel stationary with special tool (A) and remove clutch cover bolts (1), clutch cover (2) and clutch disc.

Special tool
(A) : 09924-17810



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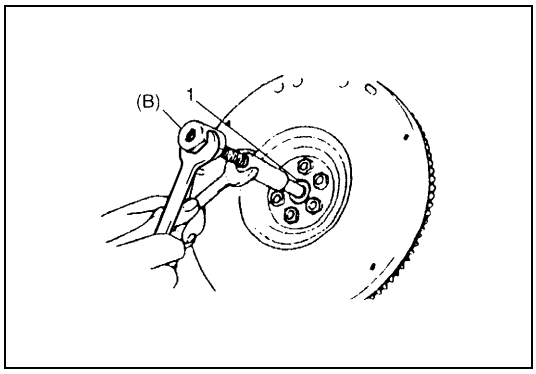
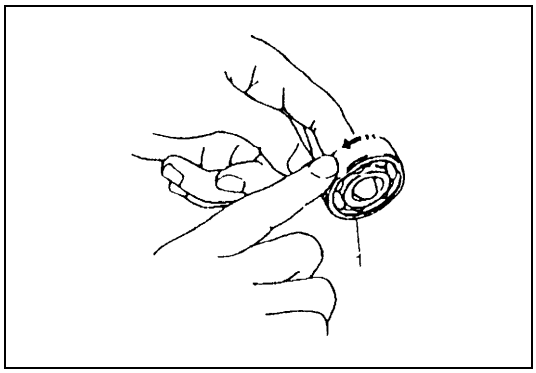


3) Pull out input shaft bearing (1) by using special tool (B), and wrench.

Special tool
(B) : 09921-26020
09930-30104

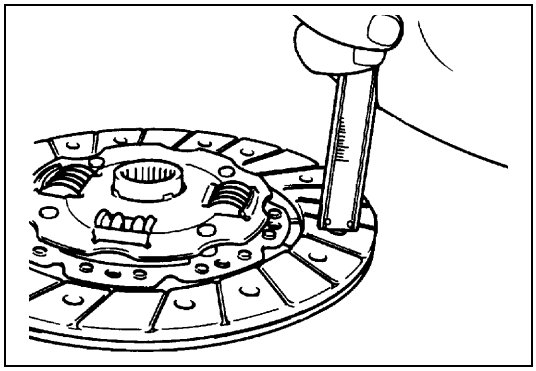
INSPECTION

Input Shaft Bearing



Check bearing (1) for smooth rotation and replace it if abnormality is found.

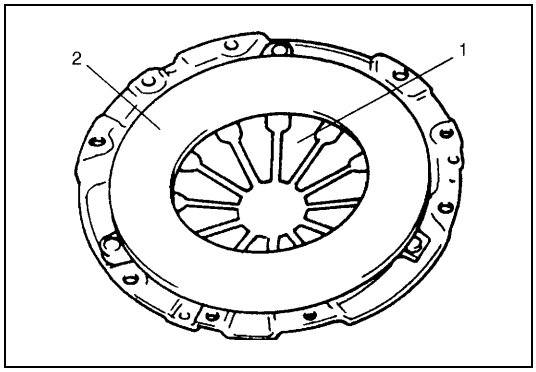
Clutch Disc



Measure depth of rivet head depression, i.e. distance between rivet head and facing surface. If depression is found to have reached service limit at any of holes, replace disc assembly.

Rivet head depth
Standard : 1.65 – 2.25 mm (0.06 – 0.09 in.)
Service limit : 0.5 mm (0.02 in.)

Clutch Cover



1) Check diaphragm spring (1) for abnormal wear or damage.
2) Inspect pressure plate (2) for wear or heat spots.
3) If abnormality is found, replace it as assembly. Do not disassemble it into diaphragm and pressure plate.

Flywheel

Check surface contacting clutch disc for abnormal wear or heat spots. Replace or repair as required.

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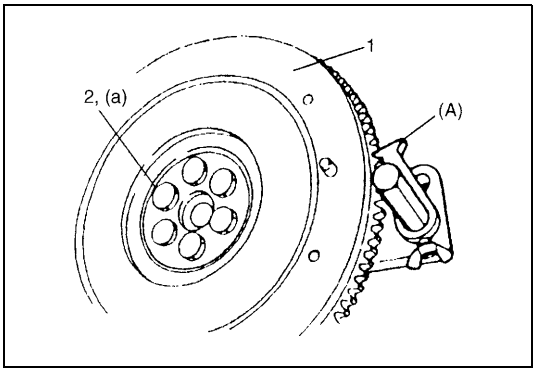
INSTALLATION

NOTE:

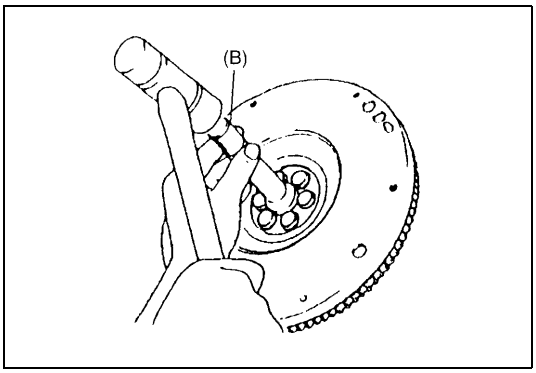
Before assembling, make sure that flywheel surface and pressure plate surface have been cleaned and dried thoroughly.



1) Install flywheel (1) to crankshaft and tighten bolts (2) to specification.

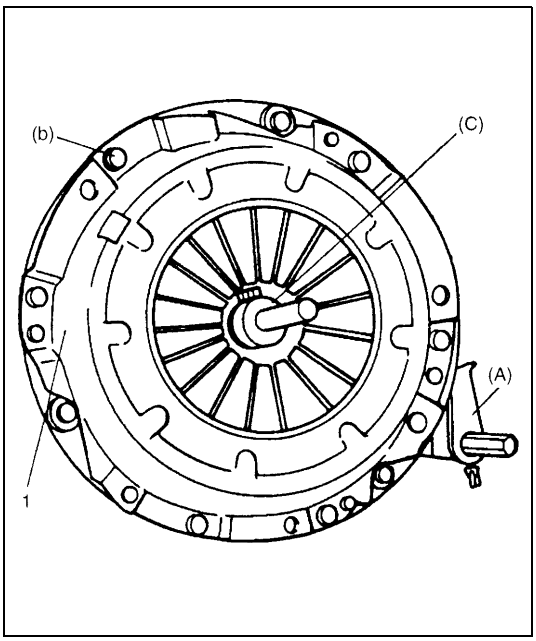
Special tool
(A) : 09924-17810

Tightening torque
Flywheel bolts (a) : 70 N·m (7.0 kg-m, 50.5 lb-ft)



2) Using special tool, install input shaft bearing to flywheel.

Special tool
(B) : 09925-98210



3) Aligning clutch disc to flywheel center by using special tool, install clutch cover (1) and bolts. Then tighten bolts to specification.

NOTE:

- **While tightening clutch cover bolts, compress clutch disc with special tool (C) by hand so that disc centered.**
- **Tighten cover bolts little by little evenly in diagonal order.**

Special tool
(A) : 09924-17810
(C) : 09923-36320

Tightening torque
Clutch cover bolts (b) : 23 N·m (2.3 kg-m, 16.5 lb-ft)

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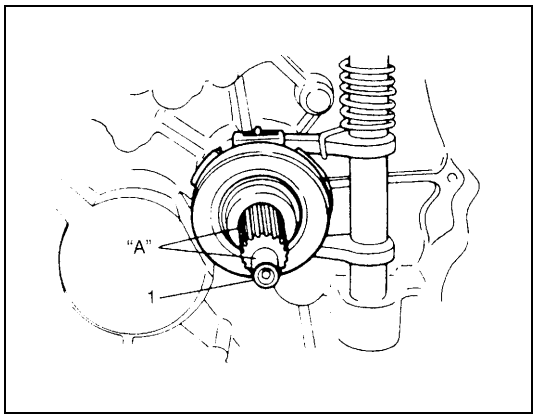


4) Slightly apply grease to input shaft (1), then join transmission assembly with engine. Refer to Section 7A for remounting procedure.

"A" : Grease, 99000-25210

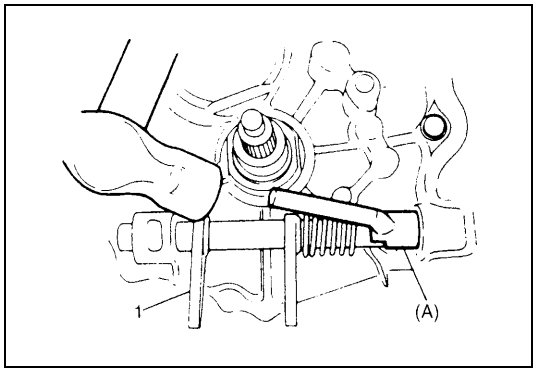
NOTE:

When inserting transmission input shaft to clutch disc, turn crankshaft little by little to match splines.

CLUTCH RELEASE SYSTEM

REMOVAL

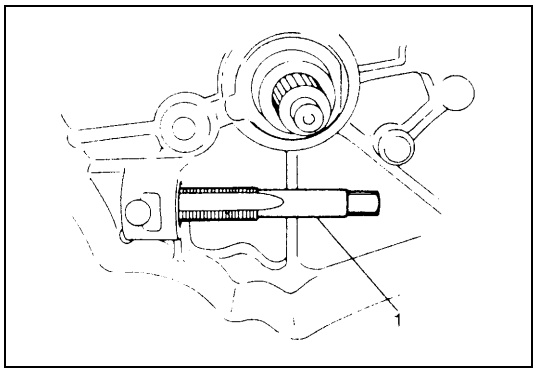
1) Remove release lever by loosening its bolt.



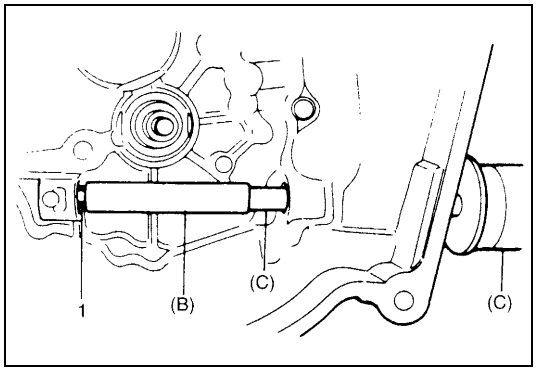
2) Take out release bearing by turning release shaft (1).
3) Unhook return spring by using pliers.
4) Drive out No.2 bush by using special tool and hammer. Release shaft seal will also be pushed out.

Special tool
(A) : 09922-46010

5) Remove release shaft and return spring.



6) Install tap (M16 X 1.5) (1) to clutch release shaft No.1 bush.



7) Pull out No.1 bush by using tap (1) and special tools.

Special tool
(B) : 09923-46020
(C) : 09930-30104

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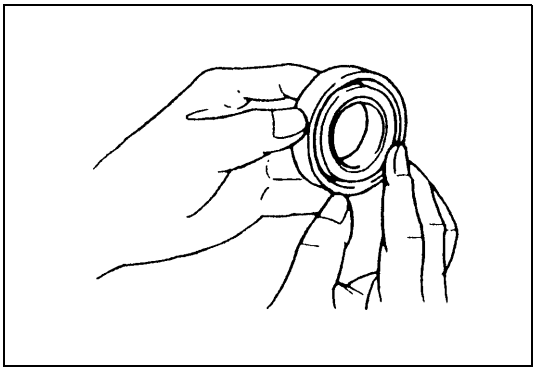
INSPECTION

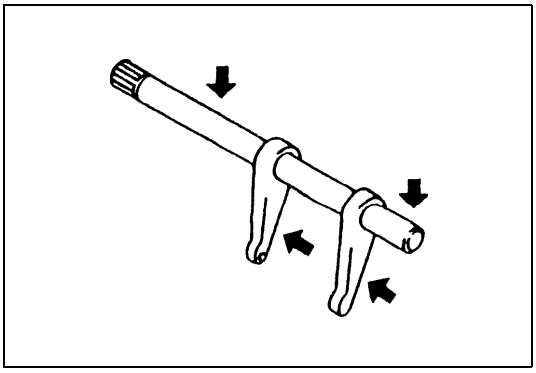
Clutch release bearing



Check clutch release bearing for smooth rotation.
If abnormality is found, replace it.

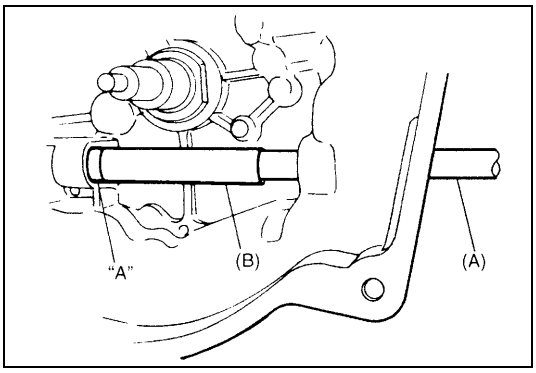
CAUTION:
Do not wash release bearing. Washing may cause grease leakage and consequential bearing damage.

Clutch release shaft



Check clutch release shaft and its pin for deflection or damage.
If abnormality is found, replace it.

INSTALLATION



1) Drive in a new No.1 bush by using special tools and then apply grease to bush inside.

Special tool
(A) : 09930-30104
(B) : 09923-46030

"A" : Grease 99000-25010

2) Install release shaft with return spring applied to it.

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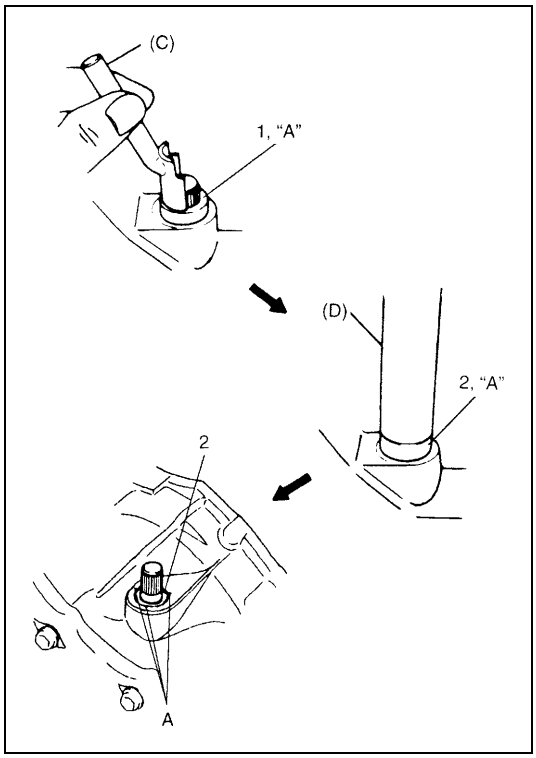


3) Apply grease to No.2 bush (1) inside and press-fit it by using the same special tool as in removal.

"A" : Grease 99000-25010

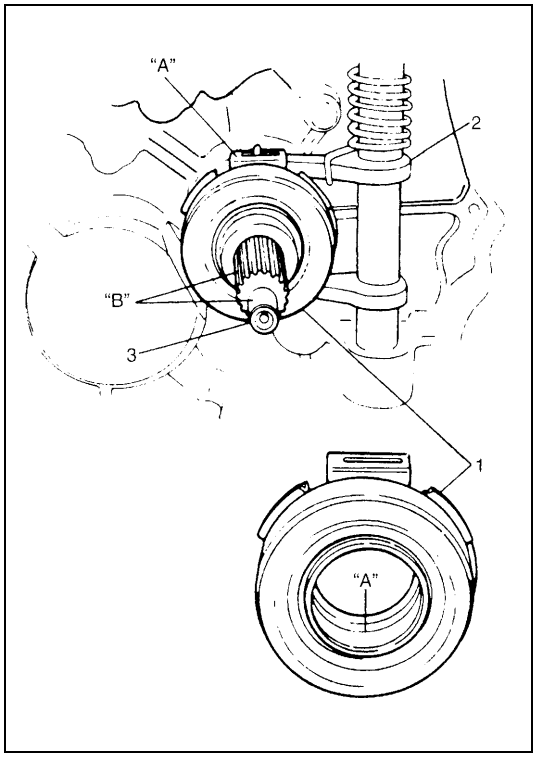
Special tool
(C) : 09922-46010

4) Coat grease to shaft seal (2) lip and then install it till it is flush with case surface. Use special tool for this installation and face seal lip downward (inside).

"A" : Grease 99000-25010

Special tool
(D) : 09925-98221

5) Caulk seal at A by using caulking tool and hammer.

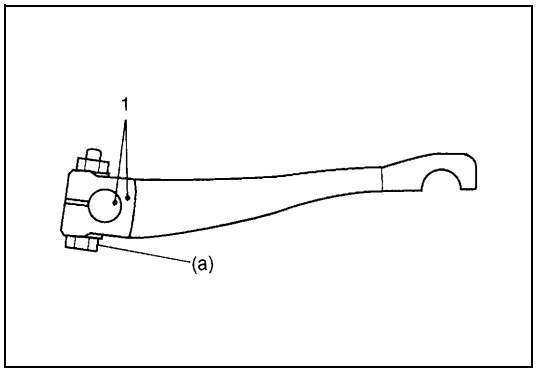


6) Hook return spring.
7) Apply grease to release bearing (1) inside and release shaft arm (2), then set bearing.

"A" : Grease 99000-25010

8) Apply small amount of grease to input shaft (3) spline (0.3 g) and front end (0.15 g) as well.

"B" : Grease 99000-25210



9) Set release lever to release shaft aligning their punch marks (1), then tighten bolt.

Tightening torque
Release lever bolt (a) : 23 N·m (2.3 kg-m, 16.5 lb-ft)

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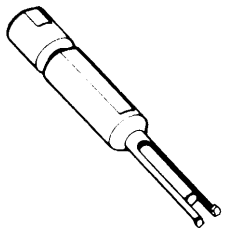
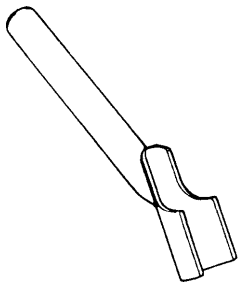
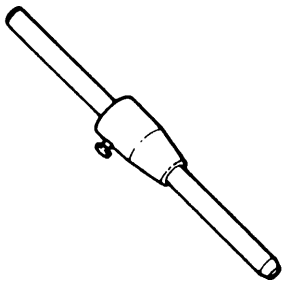
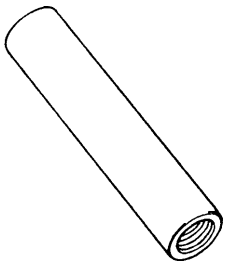
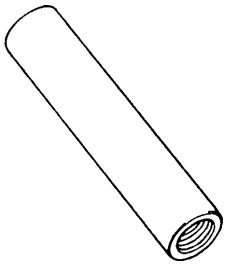
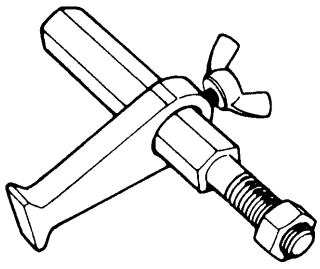
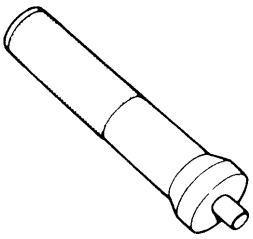
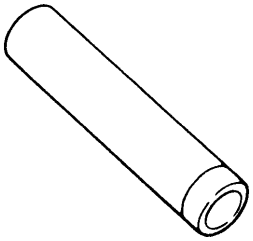
TIGHTENING TORQUE SPECIFICATION

Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
Flywheel bolts	70	7.0	50.5
Clutch cover bolts	23	2.3	16.5
Release lever bolt	23	2.3	16.5

REQUIRED SERVICE MATERIAL

Material	Recommended SUZUKI product (Part Number)	Use
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	• Cable end hook and joint pin. • Release shaft bushes and seal. • Release shaft arm. • Release bearing inside.
	SUZUKI SUPER GREASE I (99000-25210)	Input shaft spline and front end.

SPECIAL TOOL

 09921-26020 Bearing remover	 09922-46010 Bush remover	 09923-36320 Clutch center guide	 09923-46020 Joint pipe
 09923-46030 Joint pipe	 09924-17810 Flywheel holder	 09925-98210 Input shaft bearing installer	 09925-98221 Bearing installer

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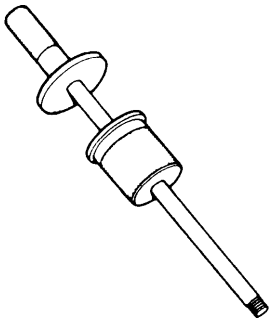

09930-30104
Sliding shaft

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SECTION 7D

TRANSFER

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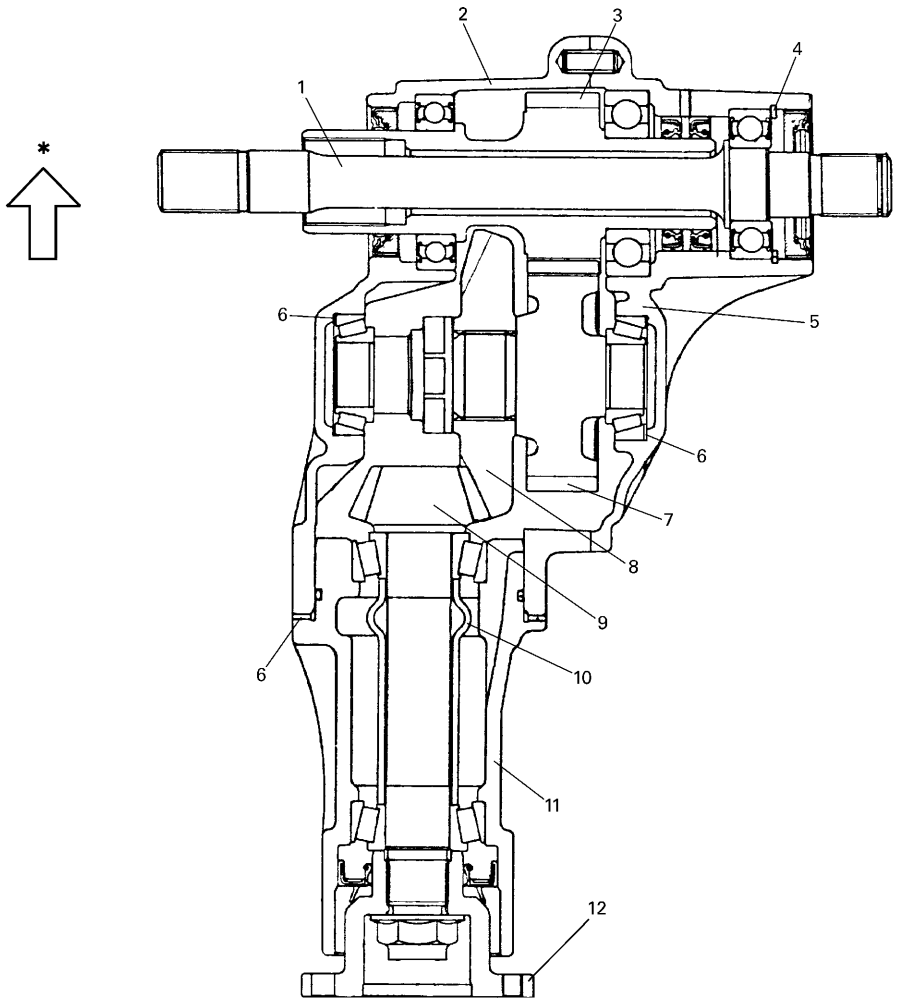
GENERAL DESCRIPTION

The transfer consists of parts as shown in figure.



1. Intermediate shaft	6. Shim	11. Transfer output retainer
2. Left case	7. Reduction driven gear	12. Flange
3. Reduction drive gear	8. Bevel gear	✱: Forward
4. Circlip	9. Bevel pinion shaft	
5. Right case	10. Pinion shaft spacer	

DIAGNOSIS

Condition	Possible Cause	Correction
Noise	Inadequate or insufficient lubricant	Replenish.
	Damaged or worn bearing(s)	Replace.
	Damaged or worn gear(s)	Replace.
	Damaged or worn chamfered tooth on sleeve or gear	Replace.
	Preload of taper roller bearing is reduced	Adjust.

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ON-VEHICLE SERVICE

OIL CHANGE

1) Before changing or inspecting oil, be sure to stop engine and lift vehicle horizontally.
2) With vehicle lifted up, check oil level and leakage. If leakage exists, correct or repair it.
3) Drain old oil, tighten drain plug (3) after applying sealant to its thread and fill new specified oil as shown below by specified amount (roughly up to level hole).

"A" : Sealant 99000-31230

Tightening torque
Transfer oil drain plug (a) : 21 N·m (2.1 kg-m, 15.5 lb-ft)

NOTE:

- **It is highly recommended to use SAE 80W-90 Hypoid gear oil API GL-5.**
- **Whenever vehicle is hoisted for any other service work than oil change, also be sure to check for oil leakage.**

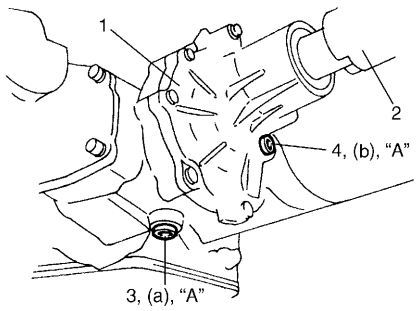
Transfer gear oil
:Hypoid gear oil API GL-5
For oil viscosity, refer to the chart.

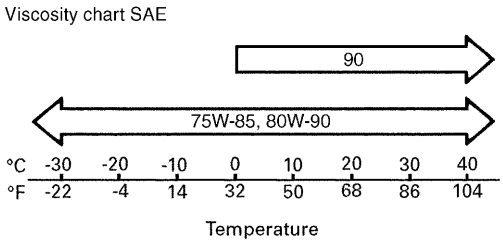
Oil Capacity
: 0.5 liters (1.1/0.9 US/Imp. pt)

4) Torque level/filler plug (4) as specified below after applying sealant to its thread.

"A" : Sealant 99000-31230

Tightening torque
Transfer oil level / filler plug
(b) : 21 N·m (2.1 kg-m, 15.5 lb-ft)





1.	Transfer
2.	Drive shaft

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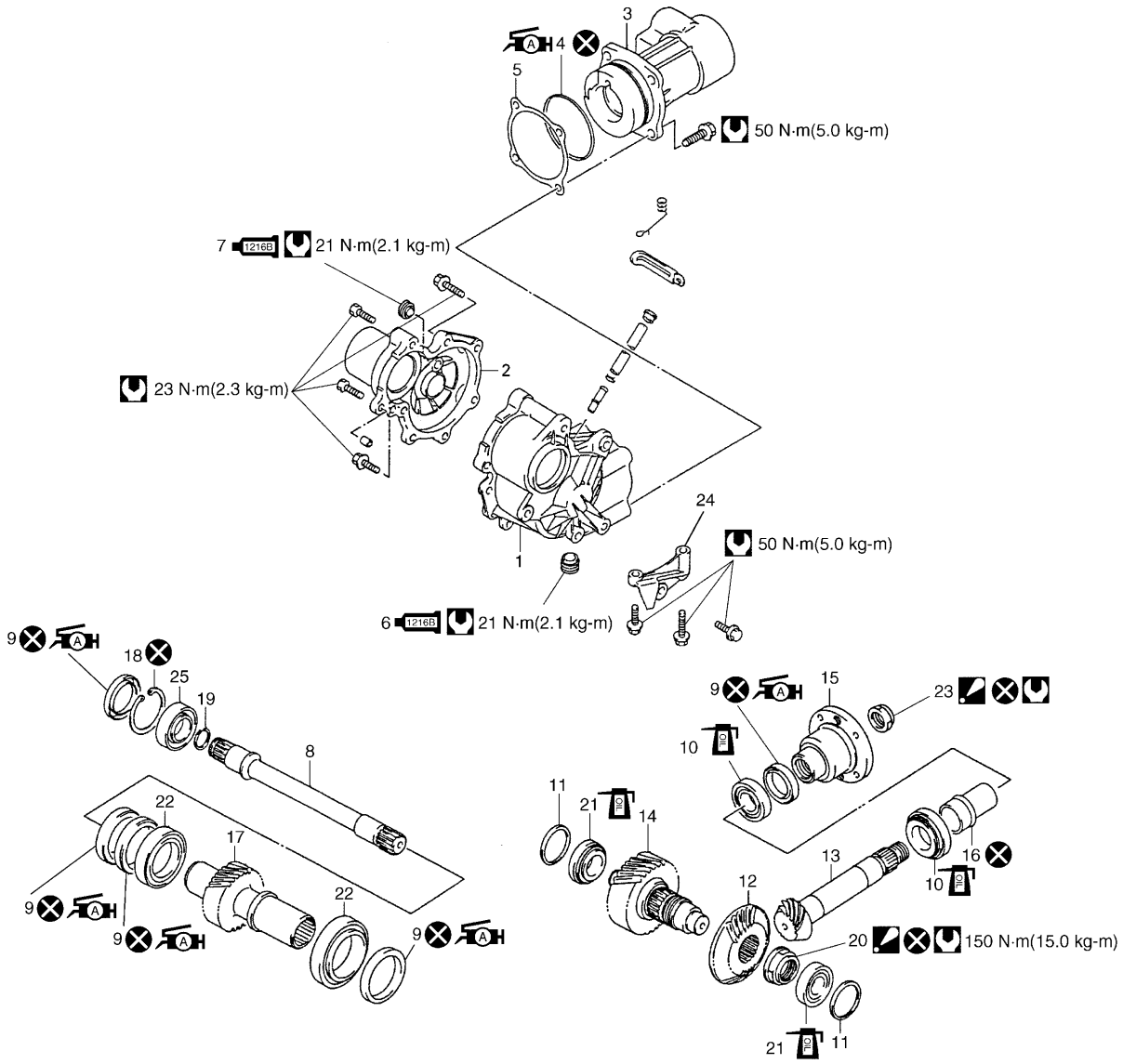
UNIT REPAIR OVERHAUL



	1.	Transfer left case	11.	Bevel gear shim	21. Driven gear bearing
	2.	Transfer right case	12.	Bevel gear (Hypoid gear)	22. Reduction drive gear bearing
	3.	Transfer output retainer	13.	Bevel pinion shaft (Hypoid gear)	23. Flange nut : After tightening nut so as rotation torque of bevel pinion shaft to be in specified value, caulk nut securely.
	4.	O-ring : Apply grease 99000-25010 to all around surface	14.	Reduction driven gear	24. Stiffener
	5.	Bevel pinion shim	15.	Flange	25. Intermediate right bearing
1216B	6.	Drain plug : Apply sealant 99000-31230 to all around thread part of drain plug	16.	Pinion shaft spacer	Do not reuse.
1216B	7.	Level plug : Apply sealant 99000-31230 to all around thread part of level plug	17.	Reduction drive gear	Tightening torque
	8.	Intermediate shaft	18.	Circlip	Apply transfer oil.
	9.	Oil seal : Apply SUZUKI SUPER GREASE A 99000-25010 to oil seal lip.	19.	Snap ring	
	10.	Pinion shaft bearing	20.	Bevel gear nut : After tightening nut to specified torque, caulk nut securely	

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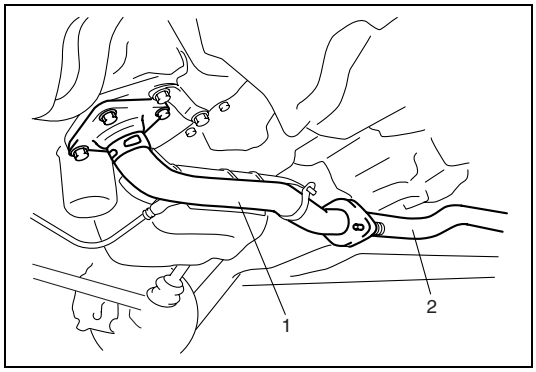
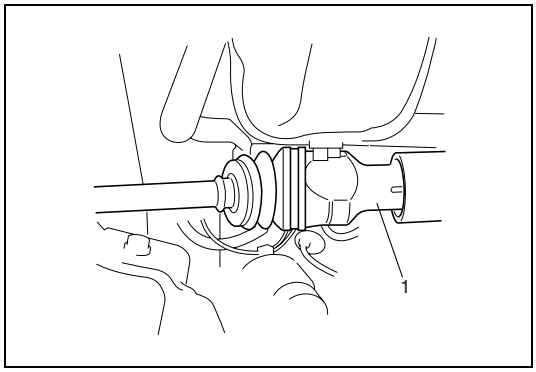
UNIT DISMOUNTING

1) Disconnect negative cable at battery.
2) Hoist vehicle and remove wheels.
3) Drain transmission oil.

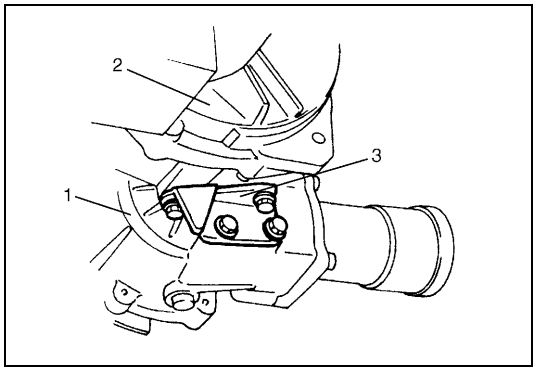


4) Remove exhaust No.1 pipe (1).
5) Remove propeller shaft.

2. Exhaust No.2 pipe

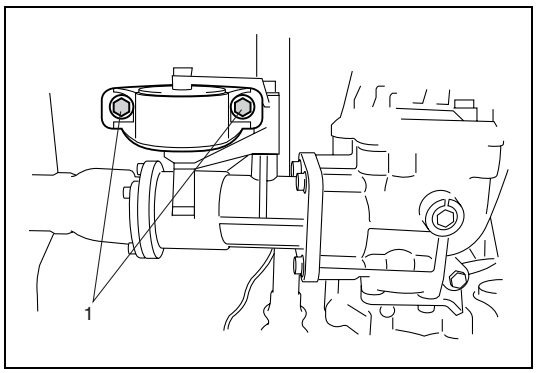


6) Remove right side drive shaft (1) refer to Section 4A.



7) Remove Stiffener (3).

1. Transfer
2. Transmission



8) With transmission assembly held on jack, remove rear mounting bolts (1).

9) Remove transfer mounting bolts and draw out transfer assembly from transmission assembly.

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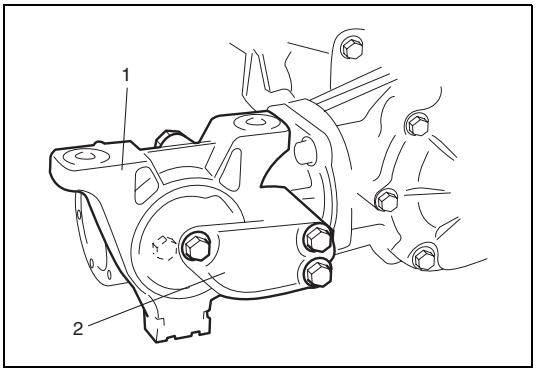
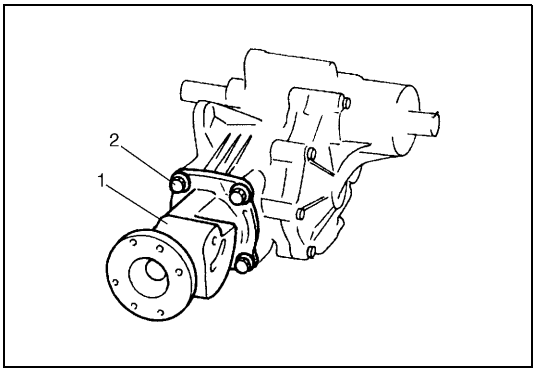


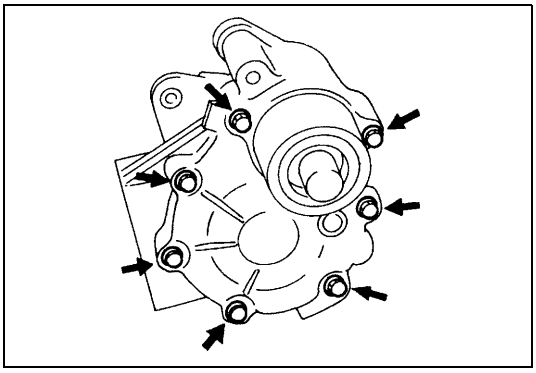
10) Remove mounting (1) and mounting bracket (2) from transfer assembly.

UNIT DISASSEMBLY

TRANSFER ASSEMBLY

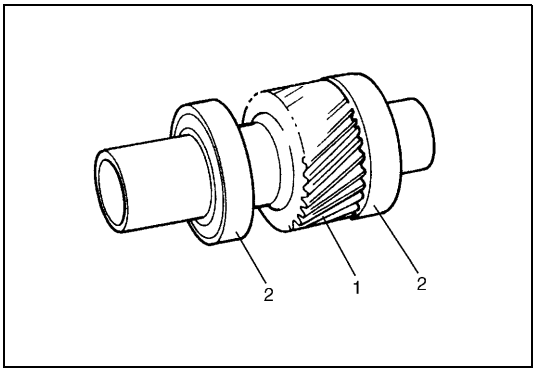


1) Remove retainer bolts (2) and remove transfer output retainer (1).



2) Remove transfer case bolts.

3) Separate right case with intermediate shaft from left case by tapping with plastic hammer.



4) Remove reduction drive gear (1) from left case by tapping with plastic hammer.

2. Bearing

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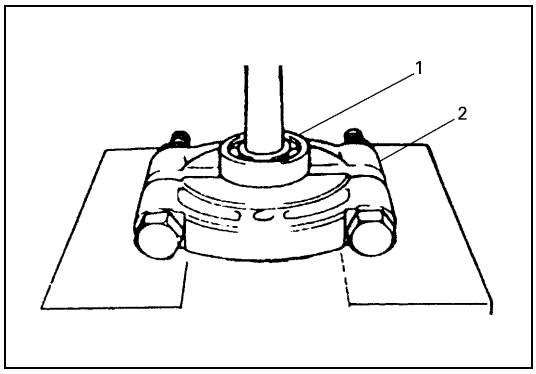
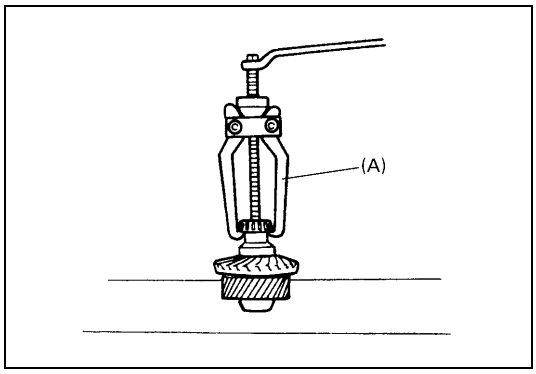


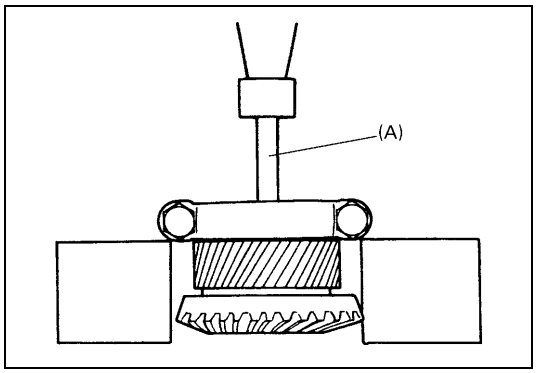
5) Remove drive gear bearings (1) (right and left) from reduction drive gear by using bearing puller (2).

REDUCTION DRIVEN GEAR



1) Drive out left side driven gear bearing by using special tool.

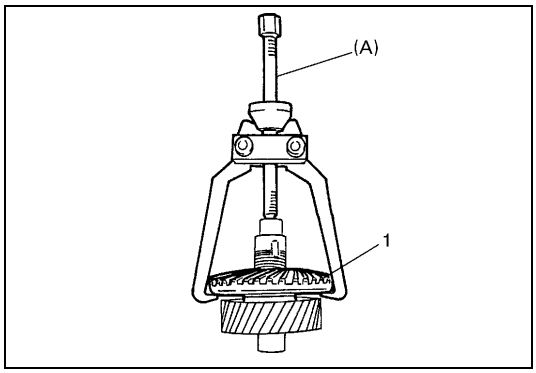
Special tool
(A) : 09913-65135



2) Drive out right side driven gear bearing by using bearing puller, press and special tool.

Special tool
(A) : 09925-58210

3) Uncaulk bevel gear nut, remove bevel gear nut while holding bevel gear with soft jawed vise.



4) Drive out bevel gear (1) by using special tool.

Special tool
(A) : 09913-65135

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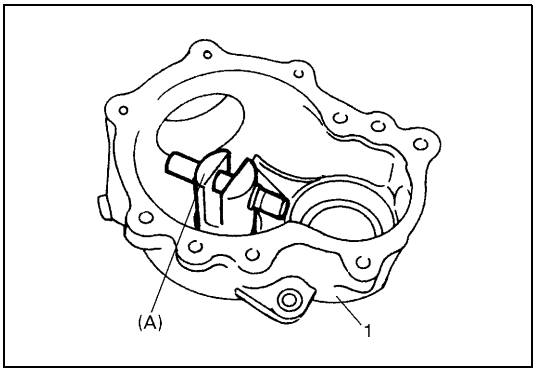
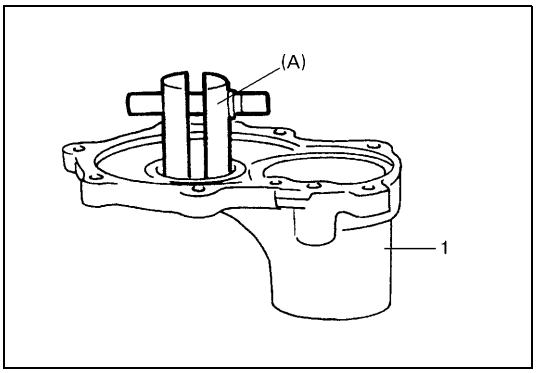


5) Remove driven gear bearing outer race from left case (1) by using special tool.

Special tool
(A) : 09941-54911

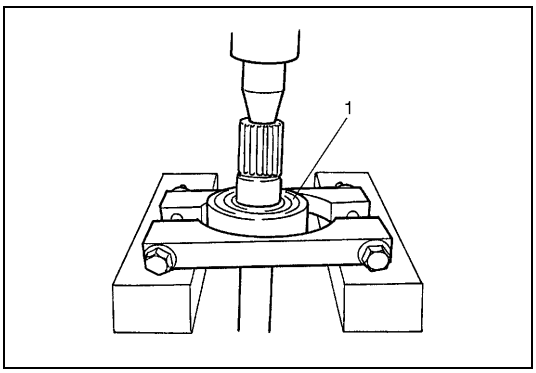


6) Remove driven gear bearing outer race from right case (1) by using special tool.

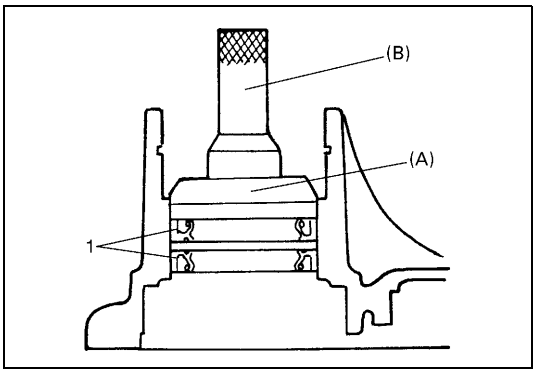
Special tool
(A) : 09941-54911

INTERMEDIATE SHAFT

1) Remove reduction drive oil seal and snap ring, and then drive out intermediate shaft.



2) Drive out intermediate right bearing (1) from intermediate shaft by using bearing puller and press.



3) Remove intermediate center oil seals (1) by using press and special tools.

Special tool
(A) : 09924-84510-005
(B) : 09913-75821

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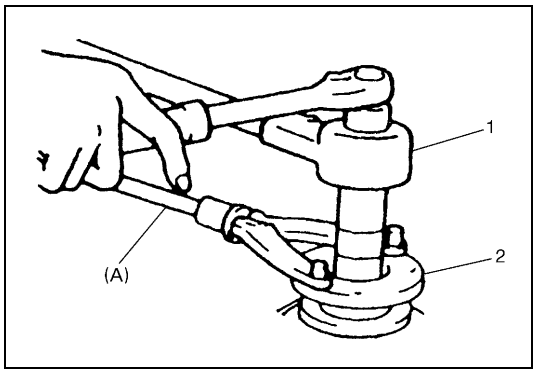
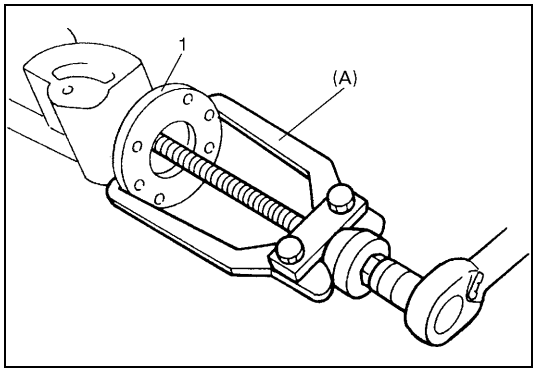
TRANSFER OUTPUT RETAINER



1) Uncaulk flange nut.
2) Remove flange nut while holding flange (2) by using special tool.

Special tool
(A) : 09930-40113

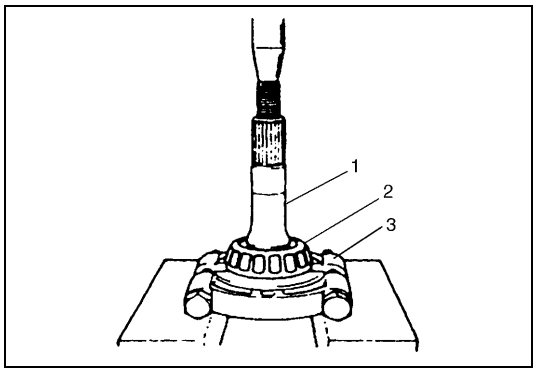
1. Power wrench



3) Remove flange (1) by special tool.

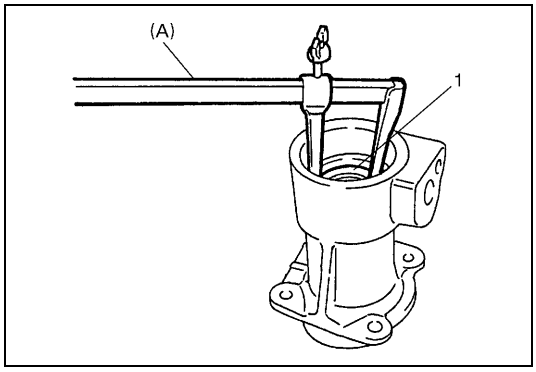
Special tool
(A) : 09913-65135

4) Drive out bevel pinion shaft from transfer output retainer by tapping with plastic hammer.
5) Drive out pinion spacer from bevel pinion shaft.



6) Drive out pinion shaft bearing (2) from bevel pinion shaft (1) by using press.

3. Bearing puller



7) Remove pinion shaft oil seal (1) by using special tool.

Special tool
(A) : 09913-50121

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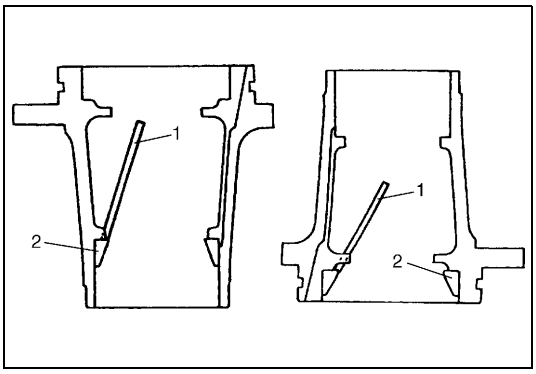


8) Drive out pinion shaft bearing outer races (2) (front and rear) by using brass bar (1).

COMPONENT INSPECTION

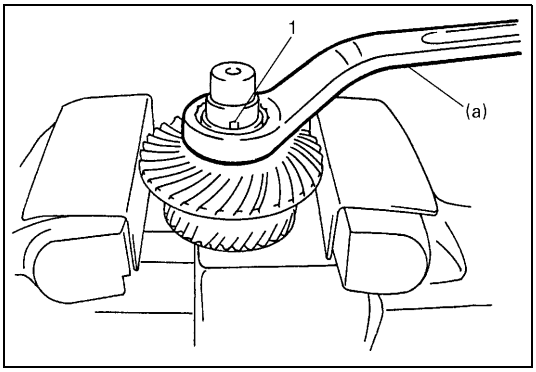
- Check each bearing for smooth rotation, wear or discoloration.
  If found abnormal, replace.
- Check oil seal for leakage and its lip for excessive hardness. If either is found, replace.
- Check transfer case for cracks.
- Check bevel pinion and bevel gear for wear or cracks.
- Check pinion gear and pinon shaft for wear or damage.

UNIT ASSEMBLY

Judging from faulty conditions noted before disassembly and what is found through visual check of bearing and gear tooth etc. after disassembly, prepare replacing parts and proceed to reassembly according to procedures as described below.

CAUTION:
- **Bevel gear and pinion must be replaced as a set when either replacement becomes necessary.**
- **When replacing taper roller bearing, replace as inner race & outer race assembly.**

REDUCTION DRIVEN GEAR



1) Drive in bevel gear to reduction driven gear.
2) Tighten bevel gear nut to specified torque while holding bevel gear with soft jawed vise and caulk (1) nut.

Tightening torque
Transfer bevel gear nut
(a) : 150 N·m (15.0 kg-m, 108.5 lb-ft)

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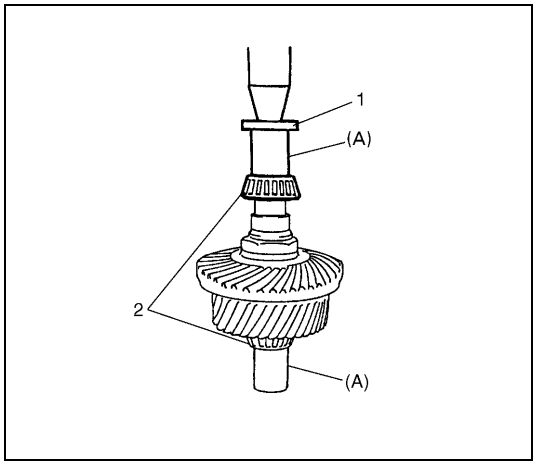
BEVEL GEAR SHIM



- Press-fit driven gear bearings (2) (right and left) to driven gear by using special tools.

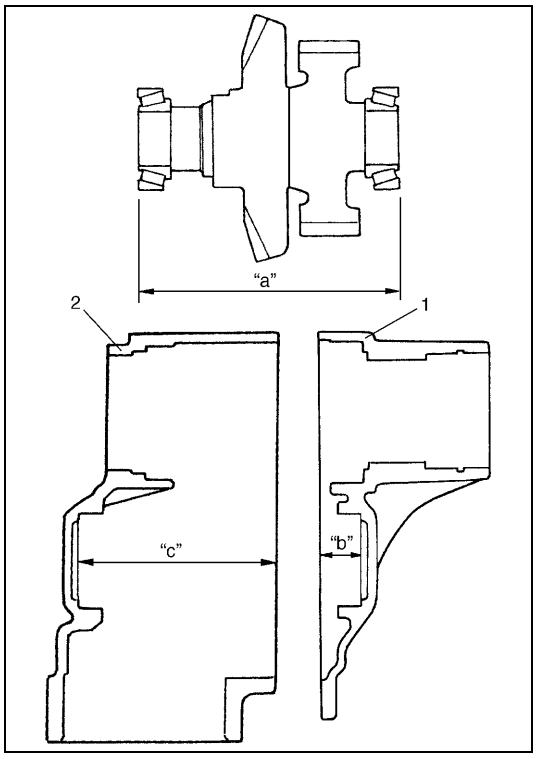
Special tool
(A) : 09945-16070

NOTE:

Support shaft with special tool as illustrated in the figure so that retainer of bearing cone will be free from compression.

1. Plate

ADJUSTMENT



- Check clearance between driven gear bearing and case.
  If the clearance is out of specification, adjust it by using shim(s) according to following procedure.
- Install driven gear bearing outer races, take measurement of distance "a" between end faces of driven gear bearing outer races.
- Measure depth "b" and "c" from mating face of right (left) case (to match with left (right) case) to face processed for installation of driven gear bearing.
- Calculate shim thickness to be inserted.
  Shim thickness = {"b" + "c" – "a" + 0.1 mm (0.004 in.)}/2
- Select shim(s) closest to calculated value.

Available shims thickness
: 0.60, 0.65, 0.70, 0.75, 0.8, 0.85, 0.90, 0.95, 1.00 and 1.05 mm (0.024, 0.026, 0.028, 0.030, 0.031, 0.033, 0.035, 0.037, 0.040, and 0.041 in.)

1. Right case
2. Left case

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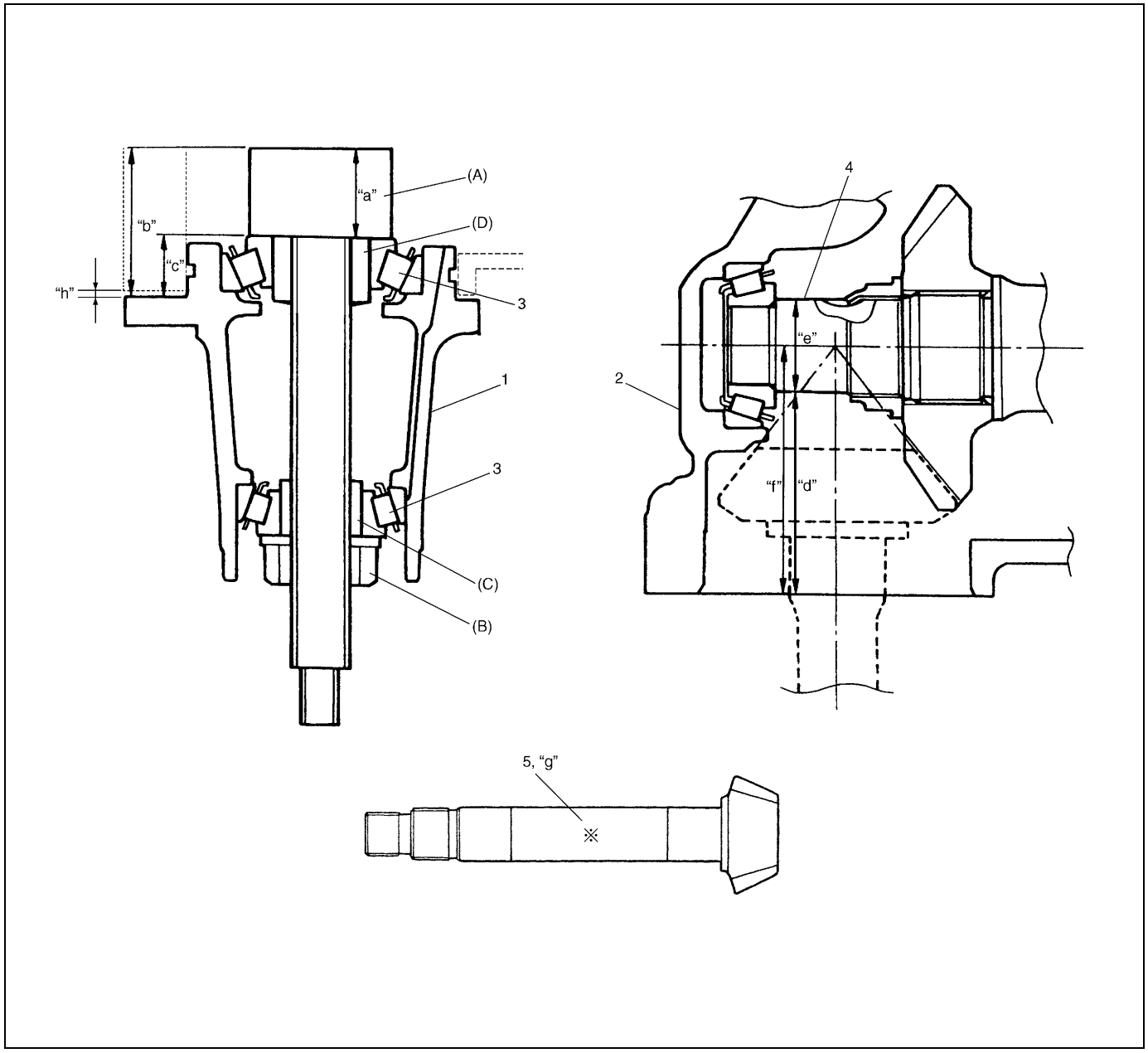
TRANSFER OUTPUT RETAINER

ADJUSTMENT



"a": Pinion dummy (special tool) height	1. Transfer output retainer
"b": Height from retainer installation face to pinion dummy	2. Left case
"c": Distance from retainer installation face to end face of bearing race ("b" – "a")	3. Pinion shaft bearing
"d": Distance from end face of left case to cylinder section of reduction driven gear	4. Reduction driven gear
"e": Outer diameter of cylinder section of reduction driven gear (29.7 mm/1.1693 in.)	5. Bevel pinion shaft
"f": Distance from end face of left case to center shaft of reduction driven gear ("d" + "e"/2)	
"g": Dimension marked on bevel pinion shaft (Marked in shaft in mm)	
"h": Shim size for mounting distance adjustment ("g" + "c" – "f")	

Special tool

(A) : 09922-76140

(B) : 09922-76150

(C) : 09922-76340

(D) : 09922-76430

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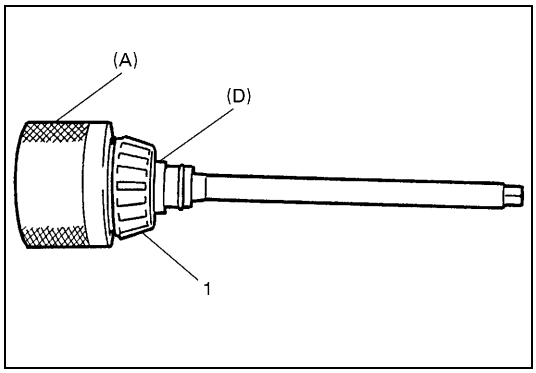
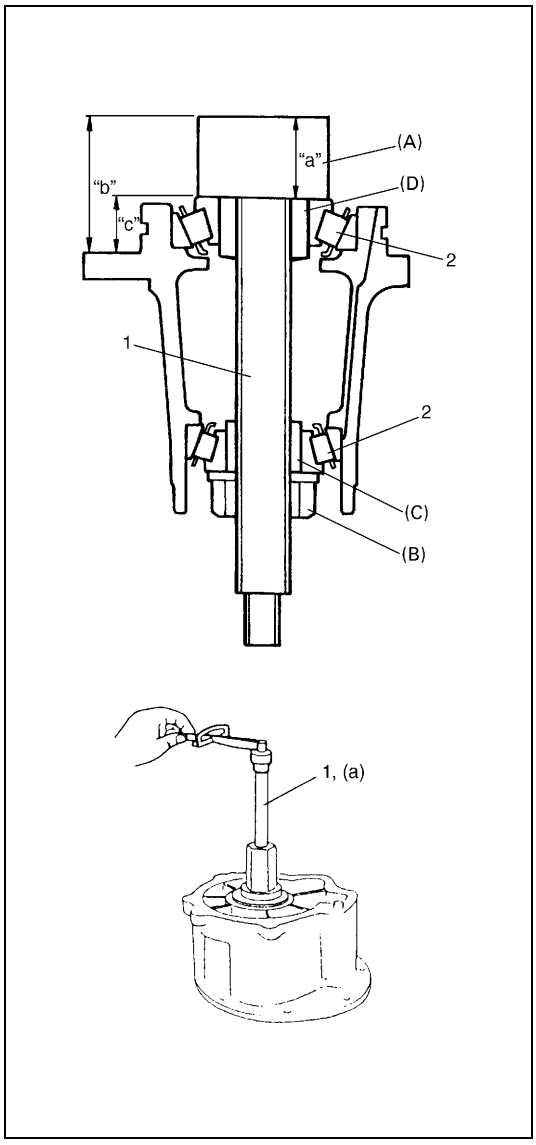
To engage bevel pinion and gear correctly, it is prerequired to install bevel pinion to transfer output retainer properly by using adjusting shim (bevel pinion shim) as described on following pages.
Shown in above page are relative positions of bevel pinion, gear and transfer output retainer.



- Install pinion shaft bearing (1) (front side) to bevel pinion dummy (special tools, refer to previous page).



- Install bevel pinion dummy (1), pinion shaft bearing (2) (rear side) and special tool (A) by using special tool (B) to transfer output retainer (refer to previous page for special tool number).

Special tool
(A) : 09922-76140
(B) : 09922-76150
(C) : 09922-76340
(D) : 09922-76430

NOTE:

This installation requires no spacer or oil seal.

- Tighten bevel pinion nut (special tool) so that specified bearing preload is obtained.

NOTE:

Before taking measurement, check for rotation by hand more than 15 revolutions.

Pinion shaft bearing preload
(a) : 5.0 – 13.0 kg-cm (4.4 – 11.2 lb-ft)

- Measure height "b" in figure by using vernier caliper. Calculate "c" by using measured value.

Distance "c"	=	Height "b"	–	Height "a"

"c":	Distance from retainer installation face to end face of bearing race
"b":	Height from retainer installation face to pinion dummy
"a":	Pinion dummy height

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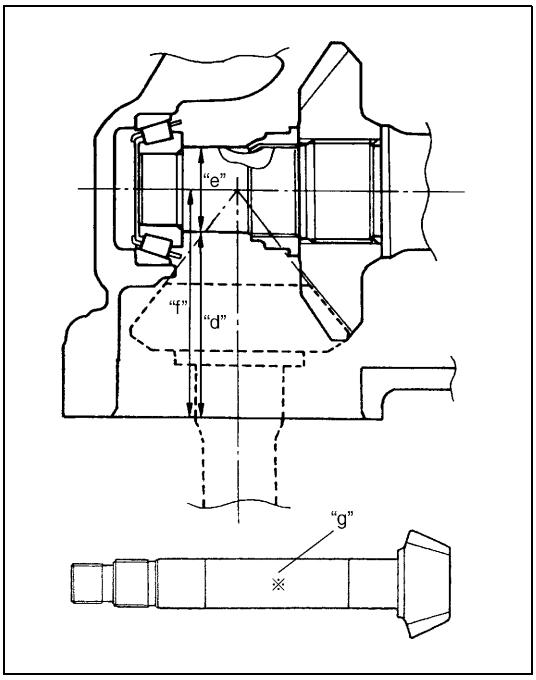


- Install reduction driven gear to left case and right case and then measure distance "d" as indicated in figure.
  Calculate "f" by using measured value.

Distance "f"	=	Distance "d"	+	14.85 mm (0.5846 in.) ("e"/2)

- Obtain adjusting shim thickness by using calculated value in following equation.

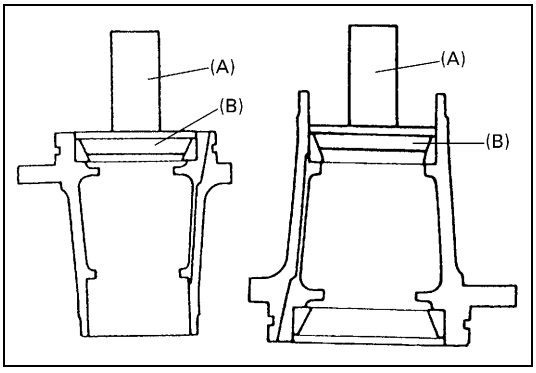
Necessary shim thickness "h"	=	Dimension "g"	+	Distance "c"	–	Distance "f"

"f":	Distance from end face of left case to center shaft of reduction driven gear
"d":	Distance from end face of left case to cylinder section of reduction driven gear
"g":	Dimension marked on bevel pinion shaft

- Select adjusting shim closest to calculated value from among following available sizes.

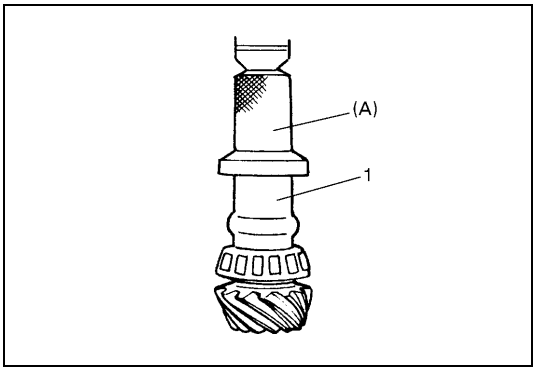
Available shims thickness
: 0.30, 2.00, 2.03, 2.06, 2.09, 2.12, 2.15, 2.18, 2.21, 2.24 and 2.27 mm (0.012, 0.079, 0.080, 0.081, 0.082, 0.083, 0.085, 0.086, 0.087, 0.088 and 0.089 in.)

ASSEMBLY



1) Press-fit pinion shaft bearing outer races (front and rear) by using special tools.

Special tool
(A) : 09913-75821
(B) : 09924-84510-005



2) Press-fit pinion shaft bearing (front side) by using special tool, press and pinion shaft spacer (1) removed in procedure UNIT DISASSEMBLY TRANSFER OUTPUT RETAINER.

Special tool
(A) : 09913-75810

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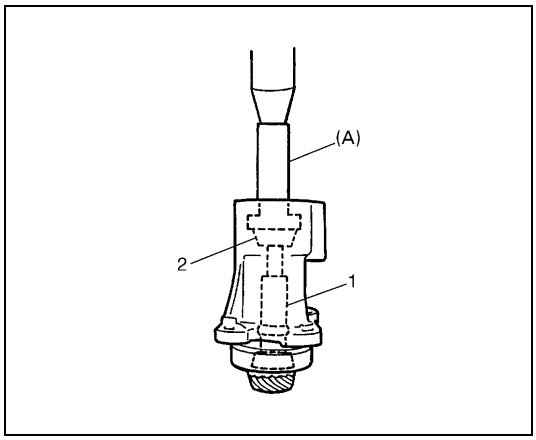
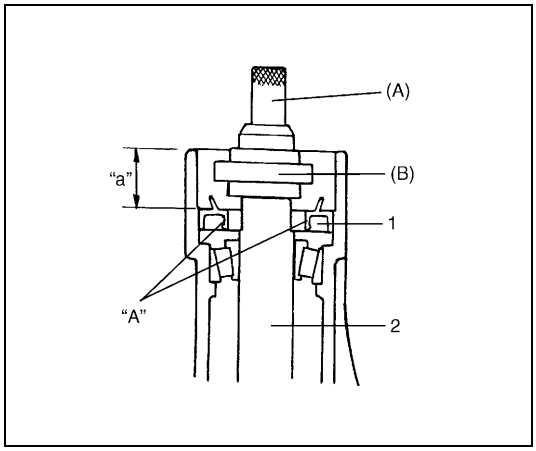


3) Install bevel pinion shaft with new pinion shaft spacer (1) to transfer output retainer.
4) Press-fit pinion shaft bearing (rear side) (2) by using special tool (and press).

Special tool
(A) : 09913-75810

CAUTION:
Press-fit bearing to such an extent that spacer is not compressed.



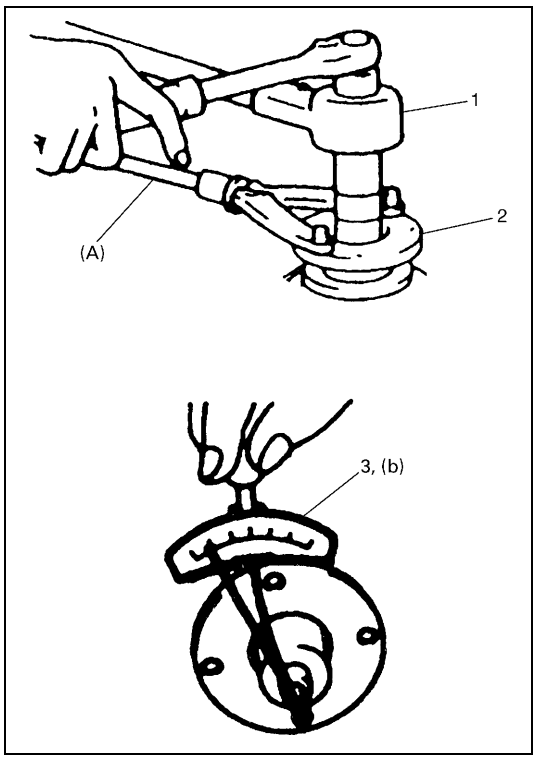
5) Drive in oil seal (1) by using special tools and apply grease to oil seal lip.

Special tool
(A) : 09913-75810
(B) : 09951-16090

"A" : Grease 99000-25010

Transfer bevel pinion shaft oil seal installing depth
"a" : 27.0 – 27.5 mm (1.063 – 1.083 in.)

2. Bevel pinion shaft



6) Install flange (2) and tighten flange nut gradually so as rotation torque of bevel pinion shaft to be in specified value.

NOTE:
- **If rotation torque of bevel pinion shaft exceeds specification given below, replace pinion shaft spacer and tighten flange nut.**
- **Before taking measurement of rotation torque, rotate pinion shaft over ten rounds in advance.**

Special tool
(A) : 09930-40113

Rotation torque for bevel pinion shaft
(b) : 0.5 – 1.3 N·m (0.05 – 0.13 kg-m, 0.30 – 0.90 lb-ft)

1. Power wrench
3. Torque wrench

7) Caulk flange nut.

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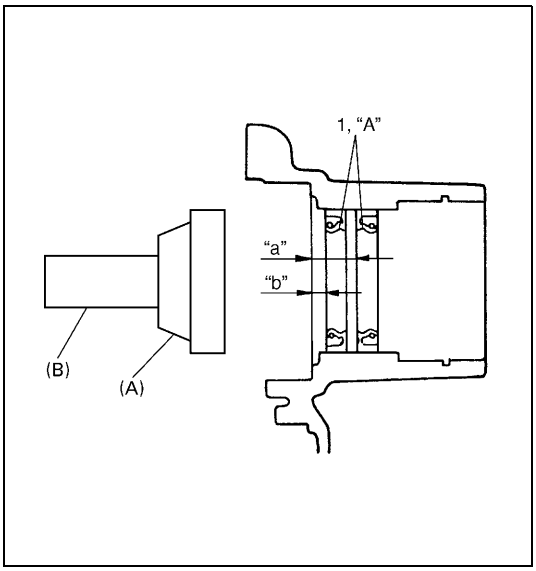
RIGHT CASE

1) Press-fit intermediate right bearing to intermediate shaft.



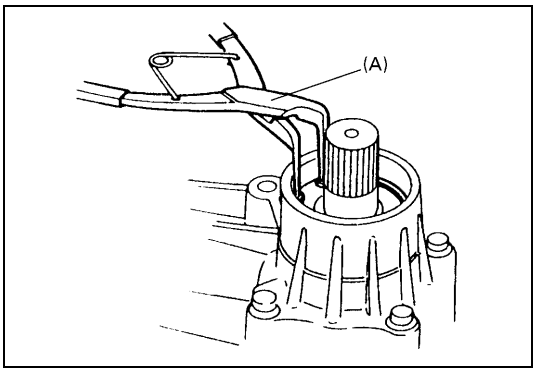
2) Install intermediate center oil seals (1) to case by using special tool and apply grease to oil seal lip.

CAUTION:
Use care the installation direction and depth of oil seals for correct installation.

Special tool
(A) : 09924-84510-005
(B) : 09913-75821

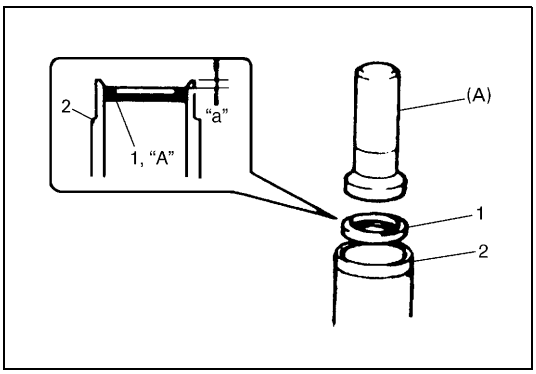
"A" : Grease 99000-25010

Transfer intermediate center oil seals installing depth
"a" : 16.0 – 16.5 mm (0.630 – 0.650 in.)
"b" : 4.0 – 4.5 mm (0.157 – 0.177 in.)



3) Install intermediate shaft to right case, and install snap ring.

Special tool
(A) : 09952-76011



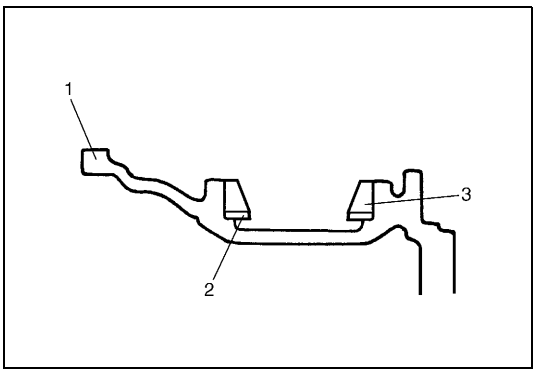
4) Install right case oil seal (1) to right case (2).

Special tool
(A) : 09913-75810

Transfer right case oil seal installing depth
"a" : 1.0 – 1.5 mm (0.039 – 0.059 in.)

5) Fill grease to inside of oil seal about 3 g (0.11 oz), and apply grease to oil seal lip.

"A" : Grease 99000-25010



6) Install bevel gear shim(s) (2) selected in item BEVEL GEAR SHIM ADJUSTMENT and driven gear bearing outer race (3) to right case (1).

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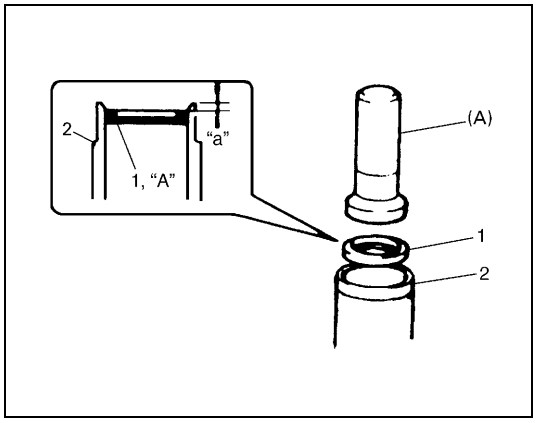
LEFT CASE

1) Install the bevel gear shim(s) selected in item BEVEL GEAR SHIM ADJUSTMENT and driven gear bearing outer race to left case.



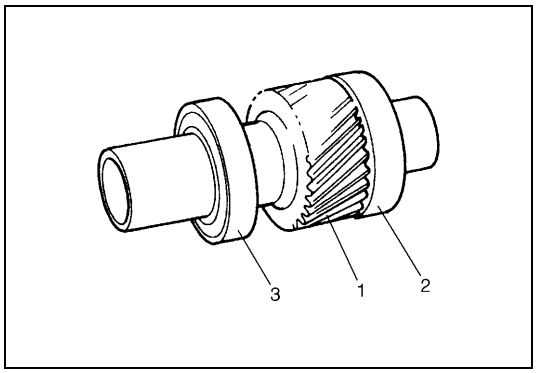
2) Install reduction drive gear oil seal (1) to left case (2) by using special tool.

Special tool
(A) : 09913-75810

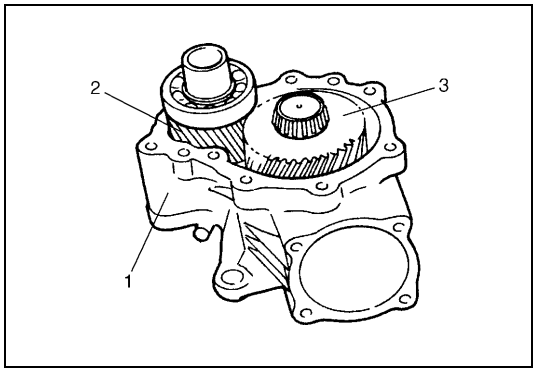
Transfer reduction drive gear oil seal installing depth
"a" : 1.5 – 2.0 mm (0.059 – 0.078 in.)

3) Fill grease to inside of oil seal about 3 g (0.11 oz), and apply grease to oil seal lip.

"A" : Grease 99000-25010

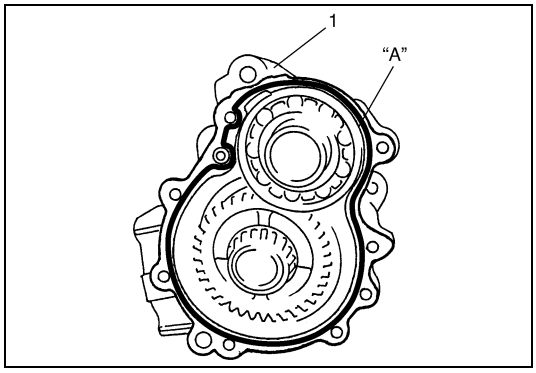


4) Press-fit drive gear bearings (right (2) and left (3)) to reduction drive gear (1).
Apply gear oil to ball part of bearing.



5) Install reduction drive gear (2) and reduction driven gear (3) to left case (1).

TRANSFER ASSEMBLY



1) Clean mating surface of right case and left case (1), and apply sealant to left case (1) by using a nozzle as shown in figure by such amount that its section is 1.5mm (0.059 in) in diameter.

"A" : Sealant 99000-31230

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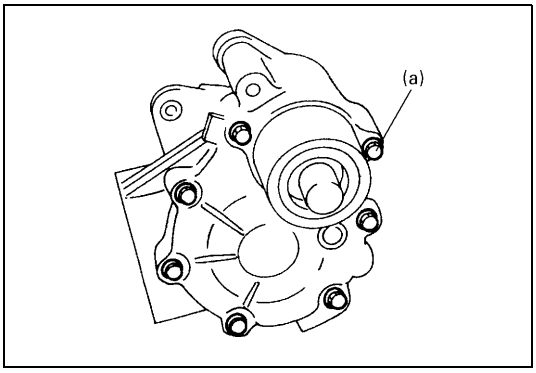
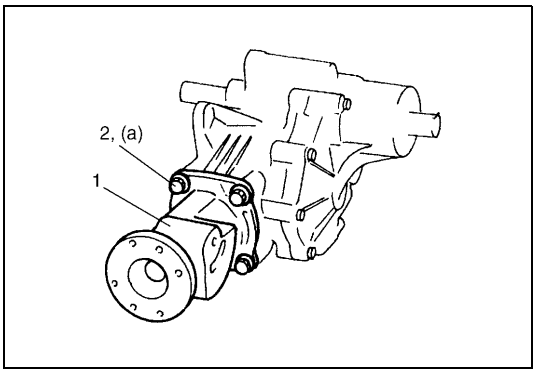


2) Tighten transfer case bolts to specified torque.

Tightening torque
Transfer case bolts (a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

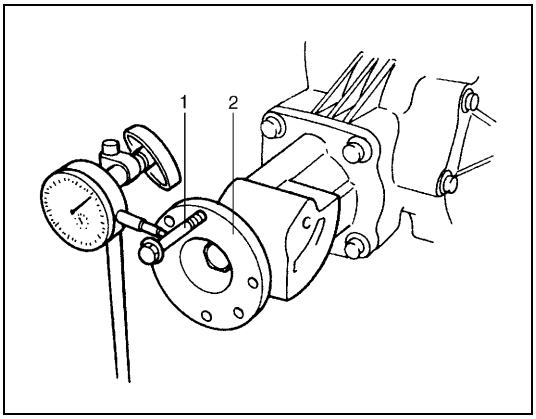


3) Install the bevel pinion shim(s) selected in preceding procedure (TRANSFER OUTPUT RETAINER ADJUSTMENT), install transfer output retainer (1) to transfer case and then tighten retainer bolts (2) to specified torque.

Tightening torque
Transfer output retainer bolts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)

BEVEL GEAR BACK LASH

MEASUREMENT

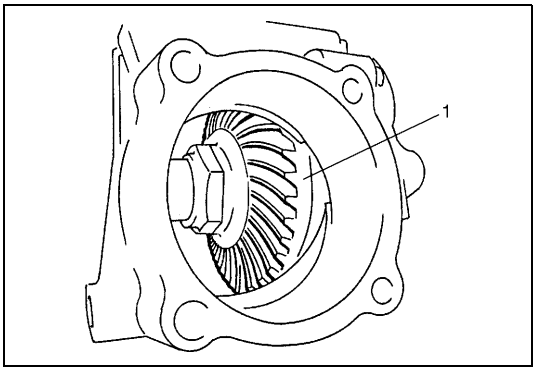


1) Install bolt to bolt hole of flange (2), set dial gauge measuring tip at right angles to bolt (1) as shown in figure.
Take measurement backlash of pinion and bevel gear.

NOTE:

If backlash exceeds specification given below, replace bevel pinion shim (between transfer case and transfer output retainer) and measure backlash again.

Transfer pinion & bevel gear backlash
: 0.1 – 0.2 mm (0.0039 – 0.0078 in.)



2) As final step, check gear tooth contact as follows.
a) After cleaning tooth surface of bevel gear (1), paint them with gear marking compound evenly by using brush or sponge etc.

NOTE:

When applying red lead paste to teeth, be sure to paint tooth surfaces uniformly. The paste must not be too dry or too fluid.

b) Turn gear to bring its painted part in mesh with bevel pinion and turn it back and forth by hand to repeat their contact.
c) Bring painted part up and check contact pattern, referring to following chart.
If contact pattern is not normal, readjust or replace as necessary according to instruction in chart.

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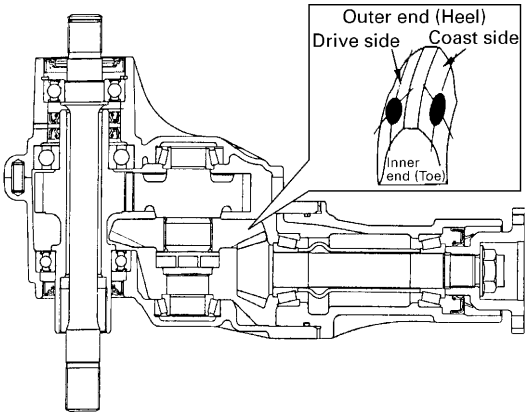
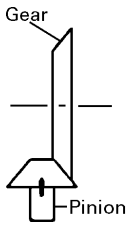
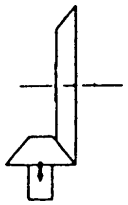
NOTE:

- **Be careful not to turn bevel gear more than one full revolution, for it will hinder accurate check.**
- **If bevel gear back lash and bevel pinion shims are adjusted properly, correct tooth contact should be provided.**
  If correct tooth contact is not provided even when they are adjusted properly, however, there may be an abnormal condition in worn tooth, transfer case or retainer. Check each component and replace as necessary.

TOOTH CONTACT PATTERN	DIAGNOSIS AND REMEDY
	NORMAL
	HIGH CONTACT Pinion is positioned too fat from the center of drive bevel gear. 1) Decrease thickness of bevel pinion shim and position pinion closer to gear center. 2) Adjust drive bevel gear backlash to specification. 
	LOW CONTACT Pinion is positioned too close to the center of drive bevel gear. 1) Increase thickness of bevel pinion shim and position pinion farther from gear center. 2) Adjust drive bevel gear backlash to specification. 

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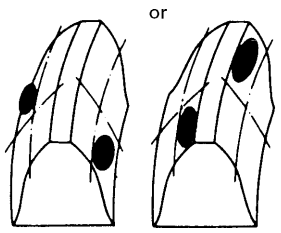
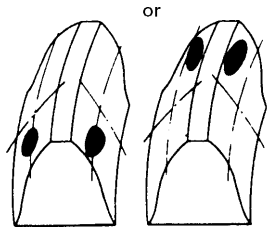
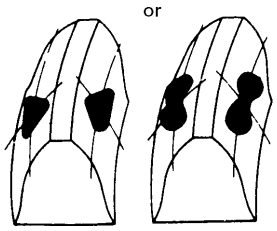
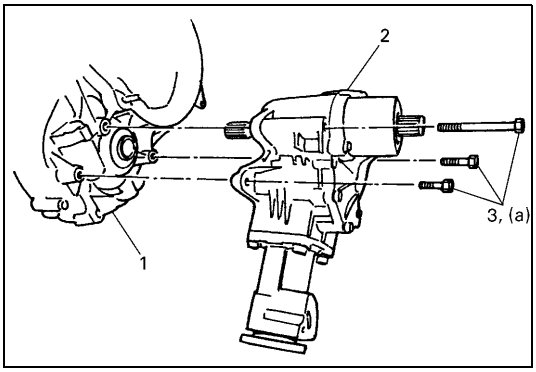
TOOTH CONTACT PATTERN	DIAGNOSIS AND REMEDY
	These contact patterns indicate that the “offset” of reduction driven gear is too much or too little. The remedy is to change the division of the bevel gear shim(s).
	These contact patterns, located on toe or heel on both drive and coast sides, mean that 1) both pinion and gear are defective, 2) retainer is not true, or 3) gear is not properly seated on transfer case. The remedy is to replace the defective member.
	Irregular patterns: If the pattern is not oval, it means that bevel gear is defective. High or low spots on tooth surfaces or on the seat of bevel gear are the cause of irregular patterns appearing on some teeth. The remedy is to replace the pinion and gear set and, if the seat is defective, so is transfer case.

UNIT INSTALLATION

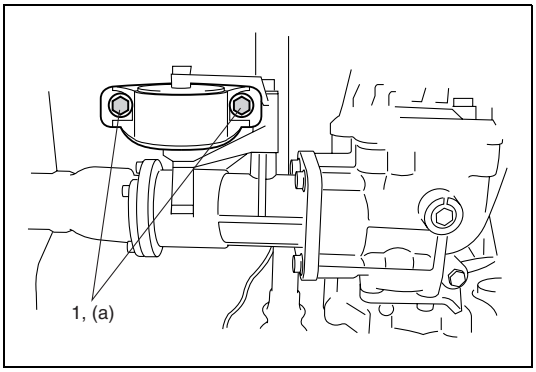


Install transfer assembly (2) by reversing removal procedure and noting following points.

- Tighten transfer mounting bolts (3) to specified torque.

Tightening torque
Transfer mounting bolts (a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)

1. Transmission



- Tighten rear mounting bracket bolts (1) to specified torque.

Tightening torque
Transfer rear mounting bracket bolts
(a) : 55 N·m (5.5 kg-m, 40.0 lb-ft)

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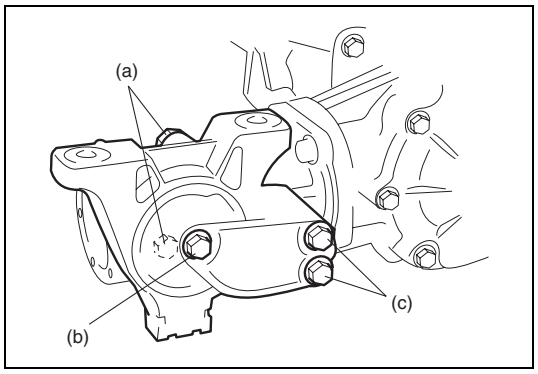
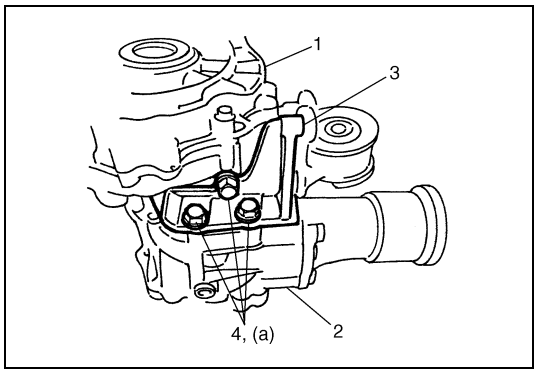


- Tighten mounting bolt and mounting bracket bolts and nuts to specified torque.

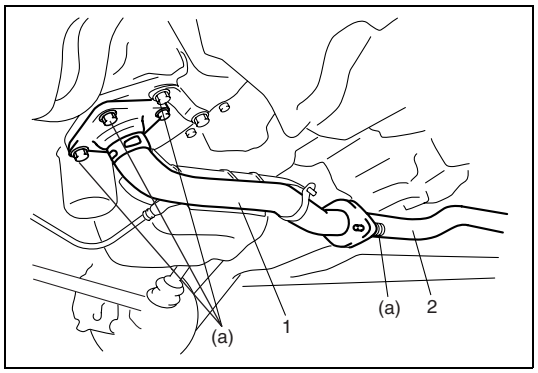
Tightening torque
Transfer rear mounting bracket nuts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)
Transfer mounting bolt
(b) : 75 N·m (7.5 kg-m, 54.5 lb-ft)
Transfer rear mounting bracket No.2 bolts
(c) : 55 N·m (5.5 kg-m, 40.0 lb-ft)



- Tighten transfer stiffener bolts (4) to specified torque.

Tightening torque
Transfer stiffener bolts (a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)

1.	Transmission
2.	Transfer
3.	Stiffener



- Tighten exhaust pipe bolts.

Tightening torque
Exhaust pipe bolts
(a) : 50 N·m (5.0 kg-m, 36.5 lb-ft)

1.	Exhaust No.1 pipe
2.	Exhaust No.2 pipe

- Install right side drive shaft, refer to Section 4A.
- Install propeller shaft and tighten propeller shaft bolts and center support bolts to specified torque (refer to Section 4B).
- Fill gear oil to transfer as specified, refer to OIL CHANGE of ON-VEHICLE SERVICE.
  Check oil level and leakage.

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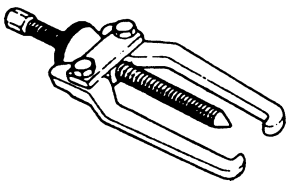
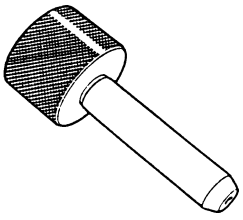
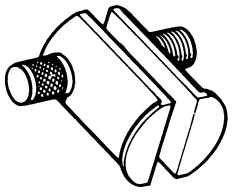
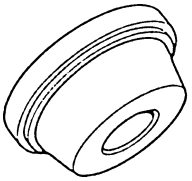
TIGHTENING TORQUE SPECIFICATION

Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
Transfer oil level/filler and drain plugs	21	2.1	15.5
Transfer bevel gear nut	150	15.0	108.5
Transfer case bolts	23	2.3	17.0
Transfer output retainer bolts	50	5.0	36.5
Transfer mounting bolts	50	5.0	36.5
Transfer rear mounting bracket bolts	55	5.5	40.0
Transfer rear mounting bracket nuts	50	5.5	36.5
Transfer mounting bolt	75	7.5	54.5
Transfer rear mounting bracket No.2 bolts	55	5.5	40.0
Transfer stiffener bolts	50	5.0	36.5
Exhaust pipe bolts	50	5.0	36.5

REQUIRED SERVICE MATERIAL

Material	Recommended SUZUKI products (Part Number)	Use
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	• Oil seal lips
Sealant	SUZUKI BOND NO. 1216B (99000-31230)	• Oil drain plug • Oil level plug • Mating surface of transfer case

SPECIAL TOOL

			
09913-65135 Bearing puller	09925-58210 Oil seal installer	09941-54911 Bearing outer race remover	09924-84510-005 Bearing installer attachment

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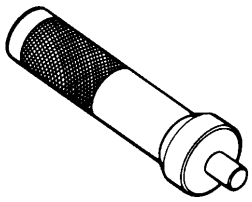
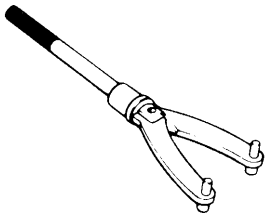
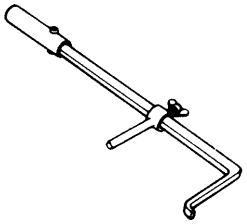
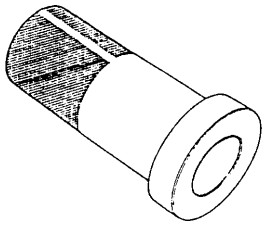
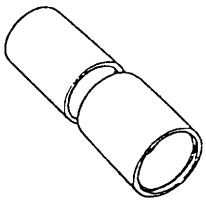
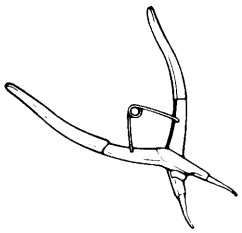
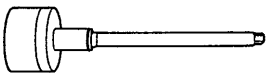
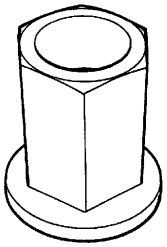
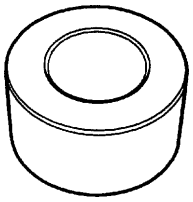
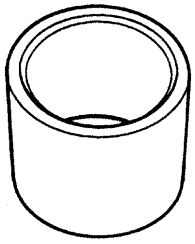
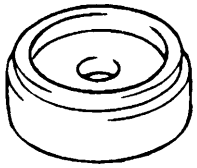
 09913-75821 Bearing installer attachment	 09930-40113 Rotor holder	 09913-50121 Oil seal remover	 09913-75810 Bearing installer
 09945-16070 Retainer ring installer set	 09952-76011 Snap ring pliers (closing type)	 09922-76140 Bevel pinion shaft	 09922-76150 Bevel pinion nut
 09922-76340 Rear collar	 09922-76430 Front collar	 09951-16090 Oil seal installer	

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SECTION 7F

REAR DIFFERENTIAL

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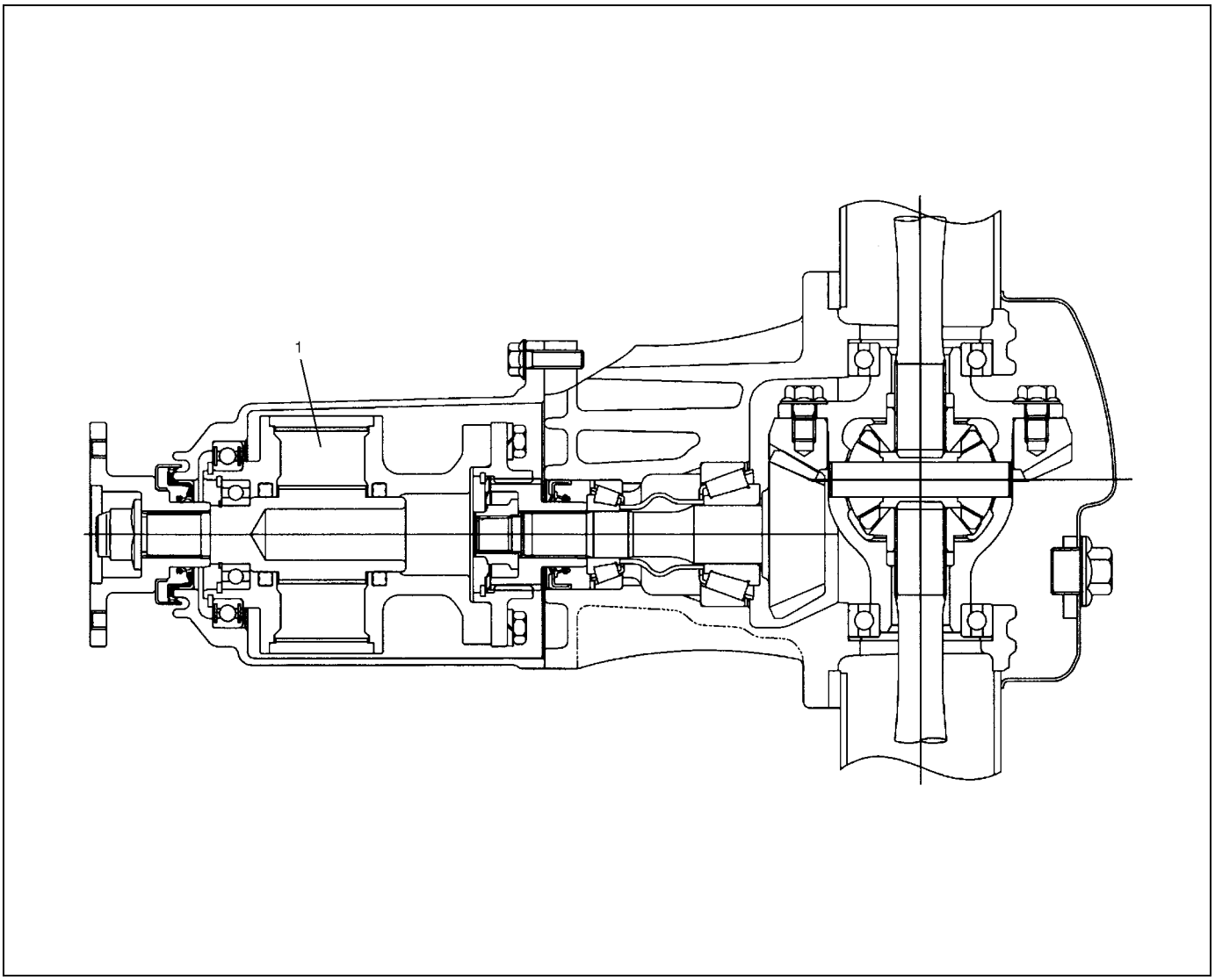
GENERAL DESCRIPTION

The differential assembly uses a hypoid bevel pinion and gear.
The differential assembly is decisive in that the drive power is concentrated there. Therefore, use of genuine parts and specified torque is compulsory. Further, because of sliding tooth meshing with high pressure between bevel pinion and gear, it is mandatory to lubricate them by hypoid gear oil.

VISCOUS COUPLING



The 4WD vehicle is equipped with a viscous coupling (1) in front of the rear differential.
The 4WD mechanism used for this vehicle distributes optimum driving force to the front and rear wheels according to road conditions and driving conditions.

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DIAGNOSIS

Condition	Possible Cause	Correction
Gear noise	Deteriorated or water mixed lubricant	Repair and replenish.
	Inadequate or insufficient lubricant	Repair and replenish.
	Maladjusted backlash between bevel pinion and gear	Adjust and prescribed.
	Improper tooth contact in the mesh between bevel pinion and gear	Adjust or replace.
	Loose bevel gear securing bolts	Replace or retighten.
	Damaged side gear(s) or side pinion(s)	Replace.
Bearing noise	(Constant noise) Deteriorated or water mixed lubricant	Repair or replenish.
	(Constant noise) Inadequate or insufficient lubricant	Repair or replenish.
	(Noise while coasting) Damaged bearing(s) of bevel pinion	Replace.
	(Noise while turning) Damaged differential side bearing(s)	Replace.
Oil leakage	Clogged breather plug	Clean.
	Worn or damaged oil seal	Replace.
	Excessive oil	Adjust oil level.

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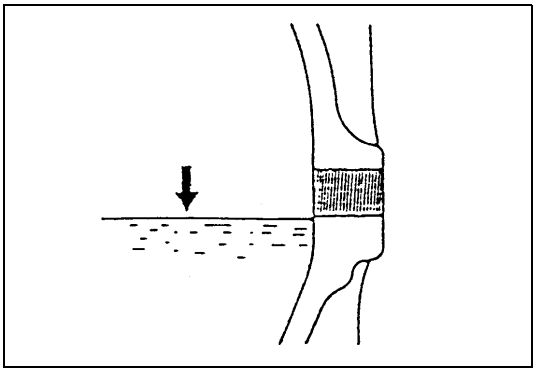
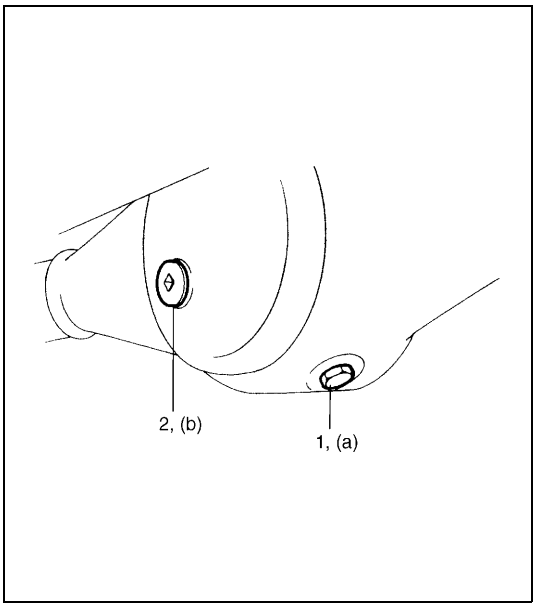
ON-VEHICLE SERVICE

OIL CHANGE



1) Before oil change or inspection, be sure to stop engine and set vehicle horizontally.
2) Check oil level and existence of leakage. If leakage is found, correct its cause.

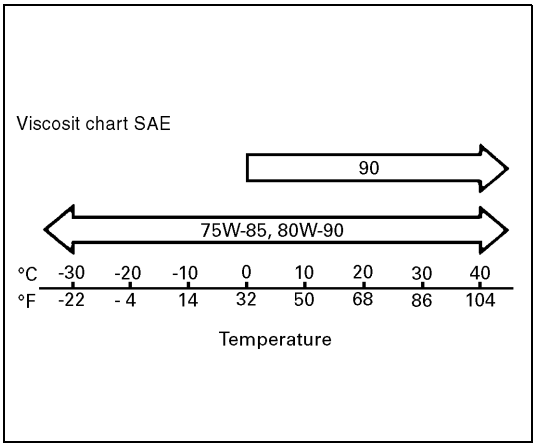


3) Remove level/filler plug (2) and drain plug (1), then drain old oil.
4) Install new gasket to drain plug and tighten drain plug to specified torque.

Tightening torque
Rear differential oil drain plug
(a) : 55 N·m (5.5 kg-m, 40.0 lb-ft)

5) Fill proper amount of new gear oil as specified below (roughly up to level hole).
6) Install new gasket to level/filler plug and tighten level/filler plug to specified torque.

Tightening torque
Rear differential oil level/filler plug
(b) : 50 N·m (5.0 kg-m, 36.5 lb-ft)



NOTE:

- **It is highly recommended to use SAE 80W-90 viscosity.**
- **Whenever vehicle is hoisted for any other service work than oil change, also be sure to check for oil leakage.**

Differential oil
: Hypoid gear oil API GL-5
For oil viscosity, refer to the chart.

Differential oil capacity
: 0.9 liters (1.9/1.6 US/Imp. pt)

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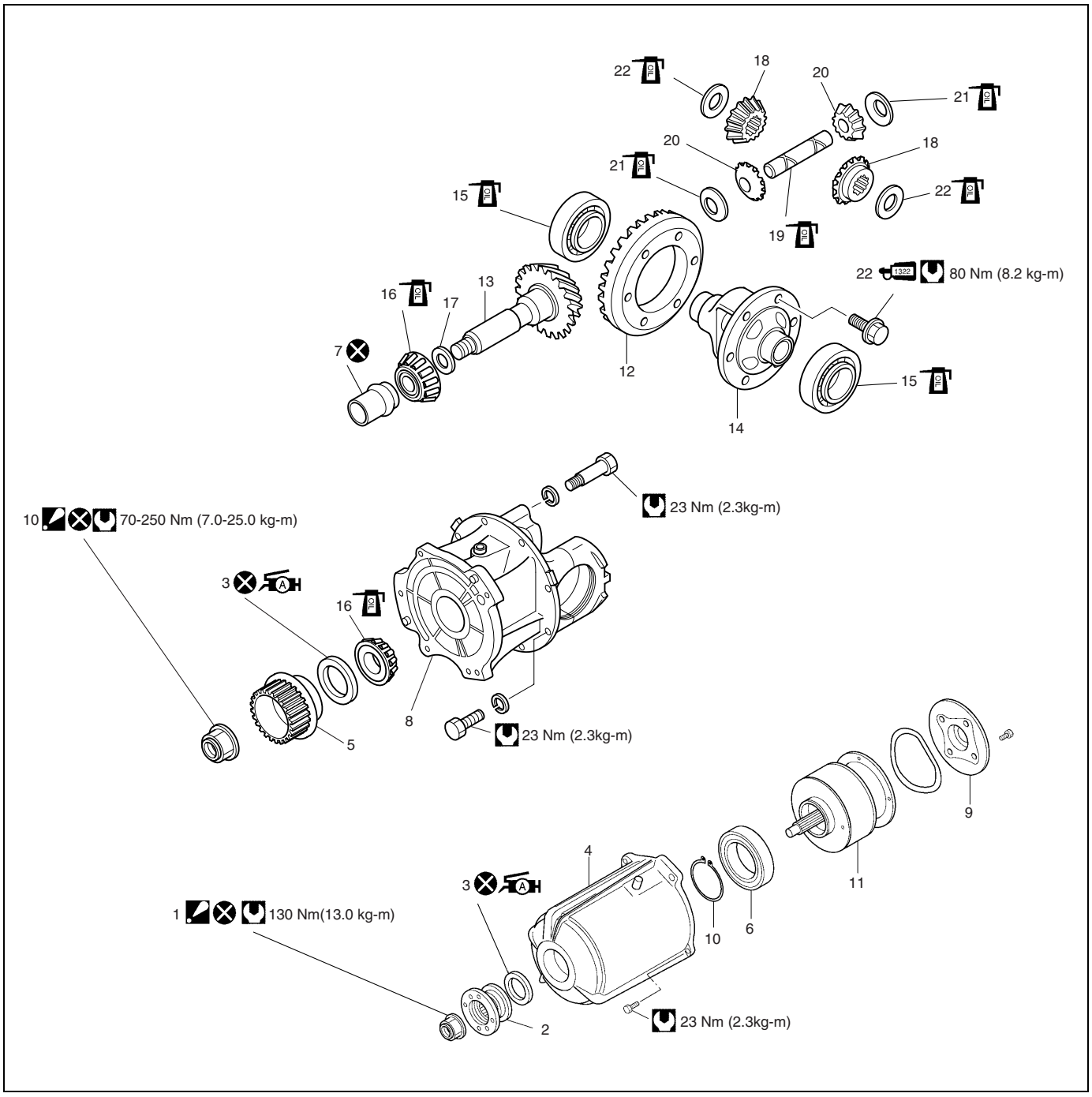
UNIT REPAIR OVERHAUL



	1. Companion flange nut : After tightening nut to specified torque, caulk nut securely.		10. Drive bevel pinion nut : After tightening nut to specified torque, caulk nut securely.		19. Differential pinion shaft
	2. Companion flange		11. Viscous coupling		20. Differential pinion
	3. Oil seal : Apply grease 99000-25010 to oil seal lip.		12. Drive bevel gear (hypoid gear)		21. Differential pinion washer
	4. Coupling case		13. Drive bevel pinion gear (hypoid gear)		22. Bevel gear bolt : Apply thread lock cement 99000-32110 to thread part of bolt.
	5. Differential input hub		14. Differential case		Do not reuse.
	6. Bearing		15. Differential side bearing		Tightening torque
	7. Spacer		16. Pinion shaft bearing		Apply differential oil
	8. Differential carrier		17. Bevel pinion shim		
	9. Rear differential input flange		18. Differential gear		

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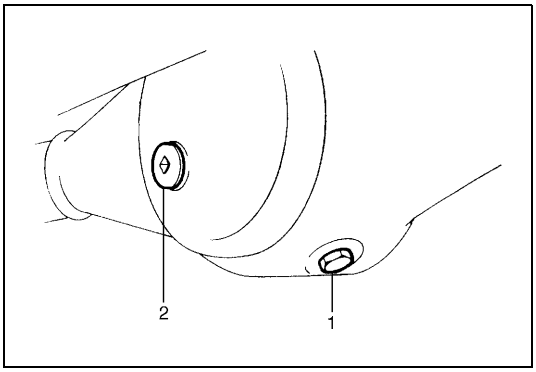
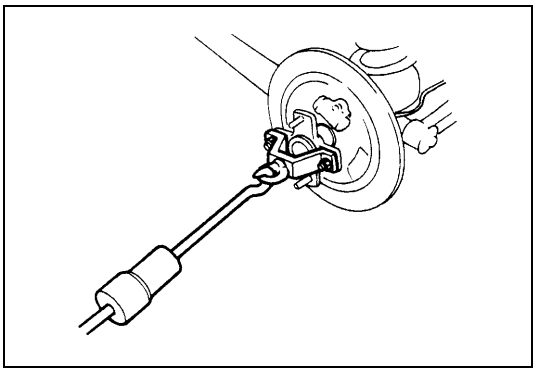
DIFFERENTIAL UNIT

DISMOUNTING

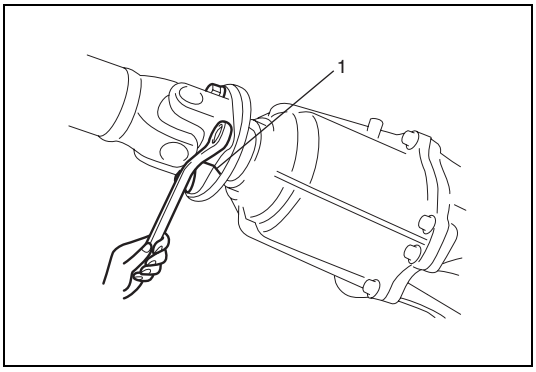


1) Hoist vehicle and remove wheels.
2) Drain oil from rear differential. (Refer to “OIL CHANGE” in this section.)

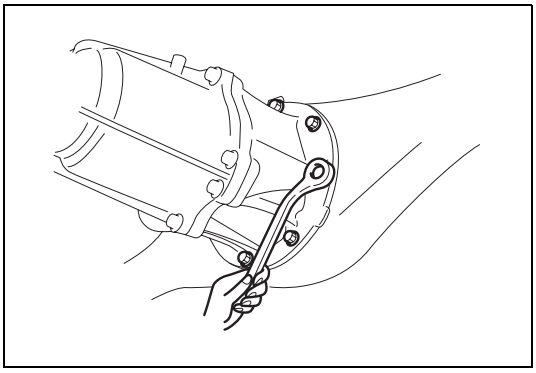
1.	Drain plug
2.	Level plug



3) Remove brake drum and disconnect parking brake cable from brake back plate.
4) Remove axle shafts, refer to “REAR AXLE SHAFT AND WHEEL BEARING REMOVAL” in Section 3E.



5) Before removing propeller shaft, give match marks (1) on joint flange and propeller shaft as shown.



6) Remove differential carrier bolts and differential assembly with viscous coupling case.

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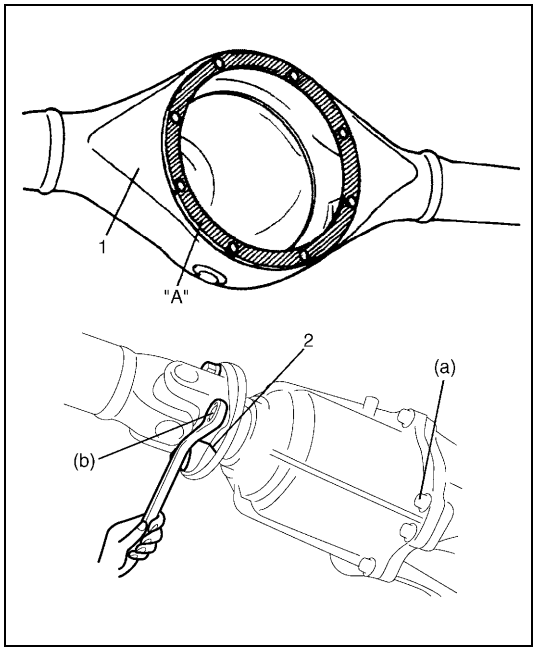
REMOUNTING

Reverse removal procedure for installation, noting the following.



Rear Differential

- Clean mating surfaces of axle housing (1) and differential carrier and apply sealant to housing side.

"A" : Sealant 9900-31110

- Install differential carrier assembly to axle housing and tighten carrier bolts to specified torque.

Tightening torque
Differential carrier bolts
(a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

- Install propeller shaft to joint flange aligning match marks (2) and tighten propeller shaft bolts to specified torque.

Tightening torque
Propeller shaft bolts
(b) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

Rear Axle Shaft

For installation of rear axle shaft, refer to "REAR AXLE SHAFT AND WHEEL BEARING INSTALLATION" in Section 3E.

Rear Brake Drum

For installation of rear brake drum, refer to "BRAKE DRUM INSTALLATION" in Section 5.

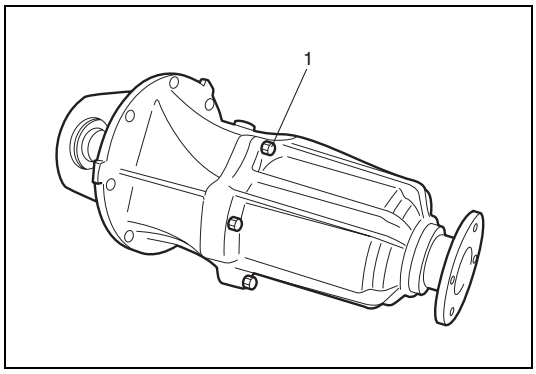
Differential Gear Oil

Refill differential housing with new specified oil. Refer to "OIL CHANGE" in this section for refill.

Brake Circuit Air Purging

Make sure to purge air out of brake circuit. Refer to "BLEEDING BRAKES" in Section 5.
Then check to ensure that joint seam of pipe is free from oil leak.

UNIT DISASSEMBLY



Remove bolts (1) and separate viscous coupling case from differential carrier.

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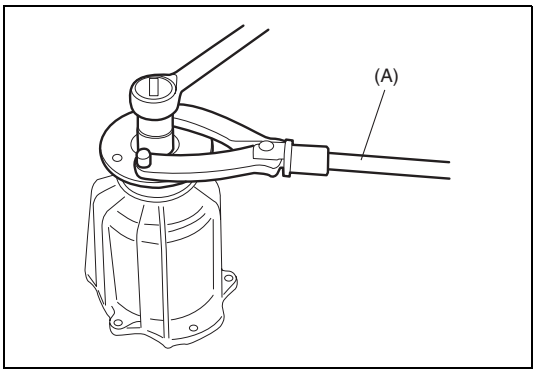
SUB-ASSEMBLY REPAIR

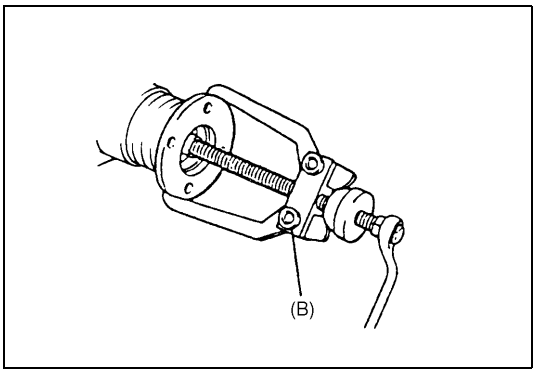
VISCOUS COUPLING

DISASSEMBLY



1) Uncaulk flange nut.
2) Hold companion flange with special tool and then remove flange nut by using power wrench.

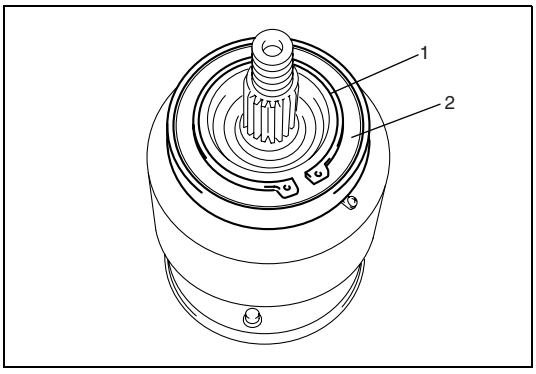
Special tool
(A) : 09930-40113



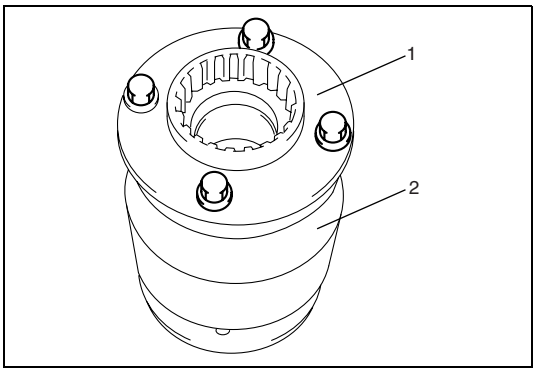
3) Remove companion flange from pinion.
Use special tool if it is hard to remove.

Special tool
(B) : 09913-65135

4) Remove viscous coupling assembly by using hydraulic press.



5) Remove snap ring (1) and remove bearing (2) by using puller.



6) Remove rear differential input flange (1) from viscous coupling (2).

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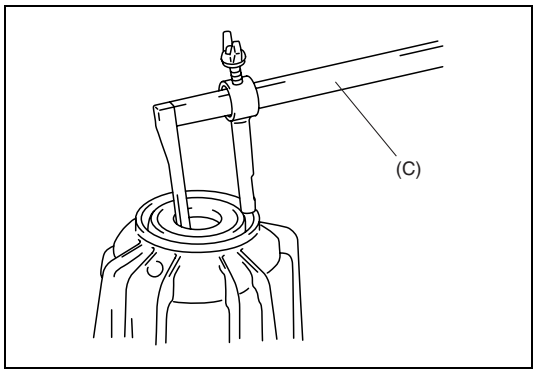


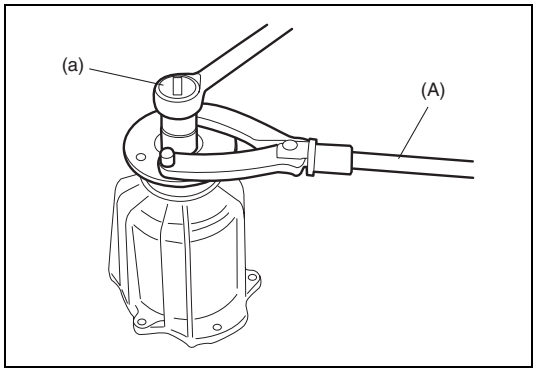
7) Remove coupling case oil seal by using special tool.

Special tool
(C) : 09913-50121

INSPECTION

- Check companion flange for wear of damage.
- Check bearing for wear or discoloration.
- Check coupling case for cracks.
- Check rear differential input flange for wear damage.

ASSEMBLY

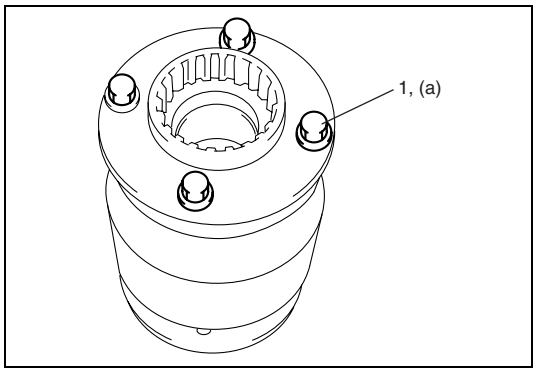


Reverse disassembly procedure for assembly, note the followings

- Tighten companion flange nut to specified torque by using special tool and caulk nut.

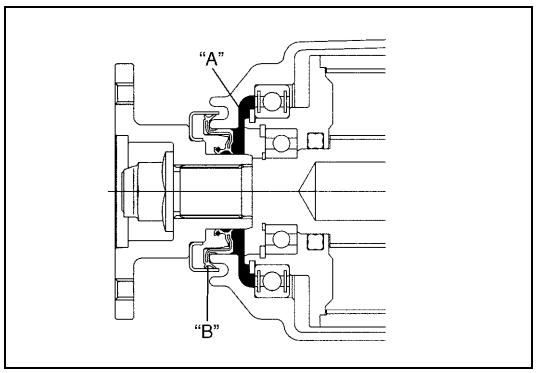
Tightening torque
Rear differential companion flange nut
(a) : 130 N·m (13.0 kg-m, 94.0 lb-ft)

Special tool
(A) : 09930-40113



- Tighten rear differential input flange bolt (1) to specified torque.

Tightening torque
Rear differential input flange bolts
(a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)



- Use new oil seal
- Apply grease (12–15 g / 0.42–0.53 oz) to oil seal lip portion and companion flange, where daubed in black as shown in figure.

"A" : Grease 99000-25010

- Apply grease (0.3–0.5 g / 0.01–0.02 oz) to oil seal dust lip portion as shown in figure.

"B" : Grease 99000-25010

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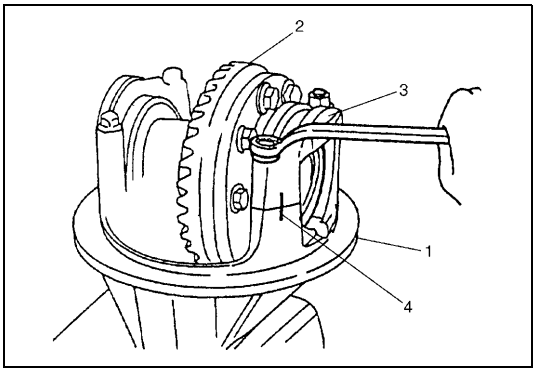
REAR DIFFERENTIAL

DISASSEMBLY

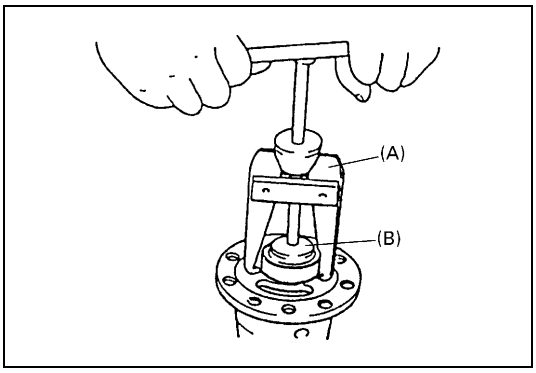


1) Put identification marks (4) on differential side bearing caps (3) and differential carrier (1).
2) Take off differential side bearing caps by removing their bolts and remove differential gear assembly (2).

NOTE:

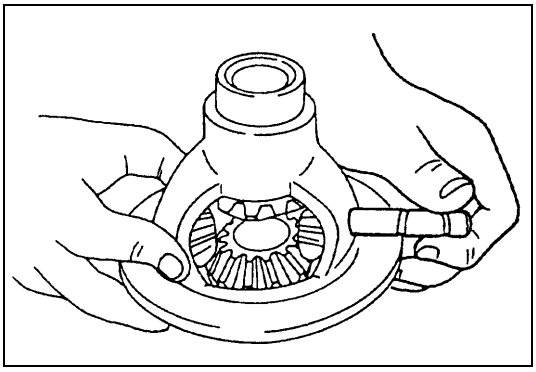
Check number of shims and thickness of each shim in advance.

3) With aluminum plates placed on vise first, grip differential case with it and remove drive bevel gear by removing its bolts.

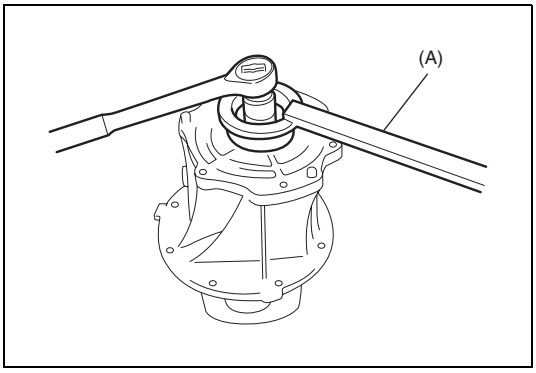


4) Using special tools, pull out differential side bearings.

Special tool
(A) : 09913-60910
(B) : 09925-88210



5) Remove differential pinion shaft.
6) Remove differential side gear, pinions and washers.



7) Uncaulk bevel pinion nut.
8) Hold differential input hub with special tool and then remove bevel pinion nut.

Special tool
(A) : 09927-28010

9) Remove differential input hub.

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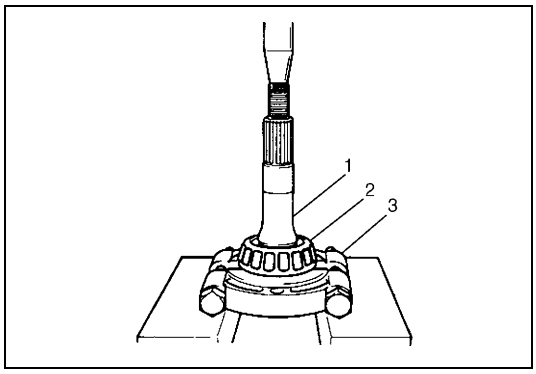
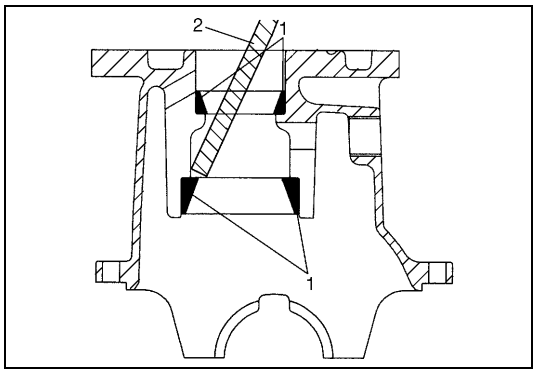


10) Remove bevel pinion (1) with rear bearing, and spacer from carrier.
11) Remove bevel pinion rear bearing (2) by using bearing puller (3) and press.



12) Drive out bevel pinion bearing outer race (1) by using metallic stick (2).

INSPECTION

- Check differential input hub for wear or damage.
- Check bearings for wear or discoloration.
- Check differential carrier for cracks.
- Check drive bevel pinion and bevel gear for wear or cracks.
- Check side gears, pinion gears and pinion shaft for wear or damage.
- Check side gear spline for wear or damage.

ADJUSTMENT AND ASSEMBLY

Judging from faulty conditions noted before disassembly and what is found through visual check of bearing and gear tooth etc. after disassembly, prepare replacing parts and proceed to reassembly according to procedures as described below.

CAUTION:

- **Bevel gear and pinion must be replaced as a set when either replacement becomes necessary.**
- **When replacing taper roller bearing, replace as inner race & outer race assembly.**

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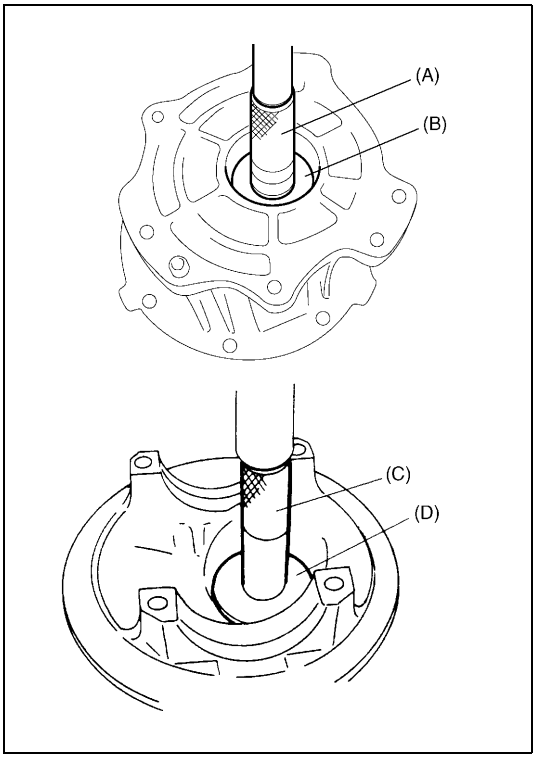
Bevel Pinion Bearing Outer Race



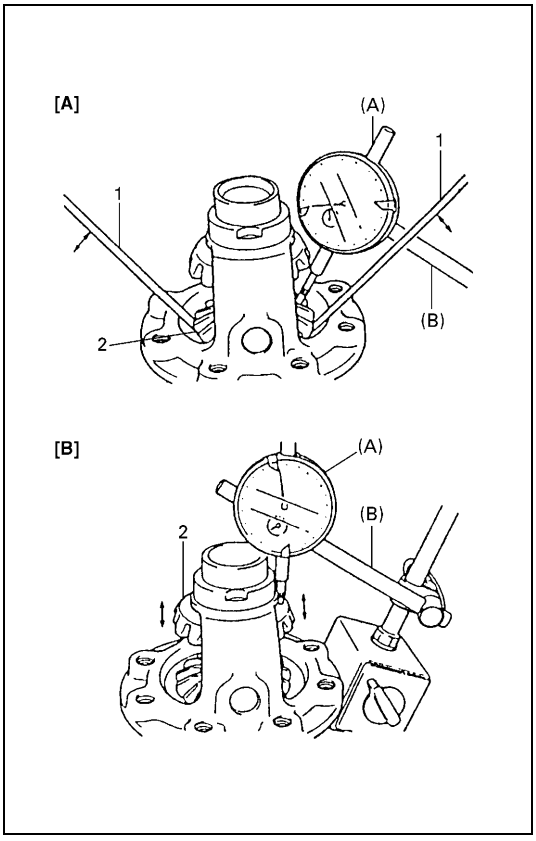
For press-fitting bevel pinion bearing outer races, use special tools as shown.

CAUTION:
Perform press-fitting carefully so as not to tilt outer race.

Special tool
(A) : 09924-74510
(B) : 09925-68210
(C) : 09925-98210
(D) : 09924-84510-002

Differential Case

Judging from abnormality noted before disassembly and what is found through visual check of component parts after disassembly, prepare replacing parts and proceed to reassembly. Make sure that all parts are clean.



1) Assemble differential gear and measure thrust play of differential gear (2) as follows.

Special tool
(A) : 09900-20606
(B) : 09900-20701

Differential gear thrust play
: 0 – 0.37 mm (0 – 0.014 in.)

[A] :	Right side
[B] :	Left side

Left Side

- Hold differential assembly with soft jawed vise and apply measuring tip of dial gauge to top surface of gear (2).
- Using 2 screwdrivers (1), move gear (2) up and down and read movement of dial gauge pointer.

Right Side

- Using similar procedure to the above, set dial gauge tip to gear shoulder.
- Move gear (2) up and down by hand and read dial gauge.

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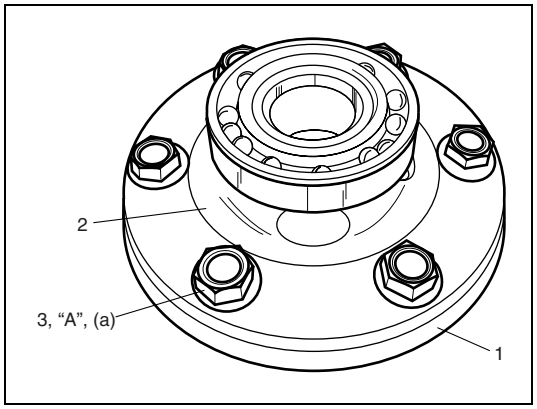
2) If thrust play is out of specification, select suitable side washer from among following available size, install it and check again that specified gear play is obtained.

Available side washer thickness
0.90, 1.00 and 1.10 mm (0.035, 0.039 and 0.043 in.)

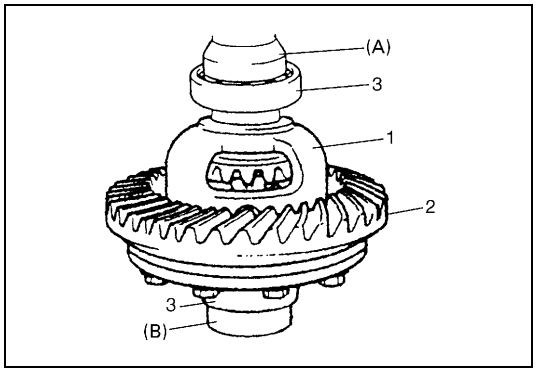


3) Put drive bevel gear (1) on differential case (2) and fasten them with bolts (3) by tightening them to specified torque. Use thread lock cement for bolts (3).

CAUTION:
Use of any other bolts than that specified is prohibited.

“A” : Thread lock cement 99000-32110

Tightening torque
Drive bevel gear bolts (a) : 80 N·m (8.0 kg-m, 58.0 lb-ft)



4) Press-fit differential side bearings (3) to differential case (1) by using special tools.

Special tool
(A) : 09951-76010
(B) : 09951-16060

2. Drive bevel gear

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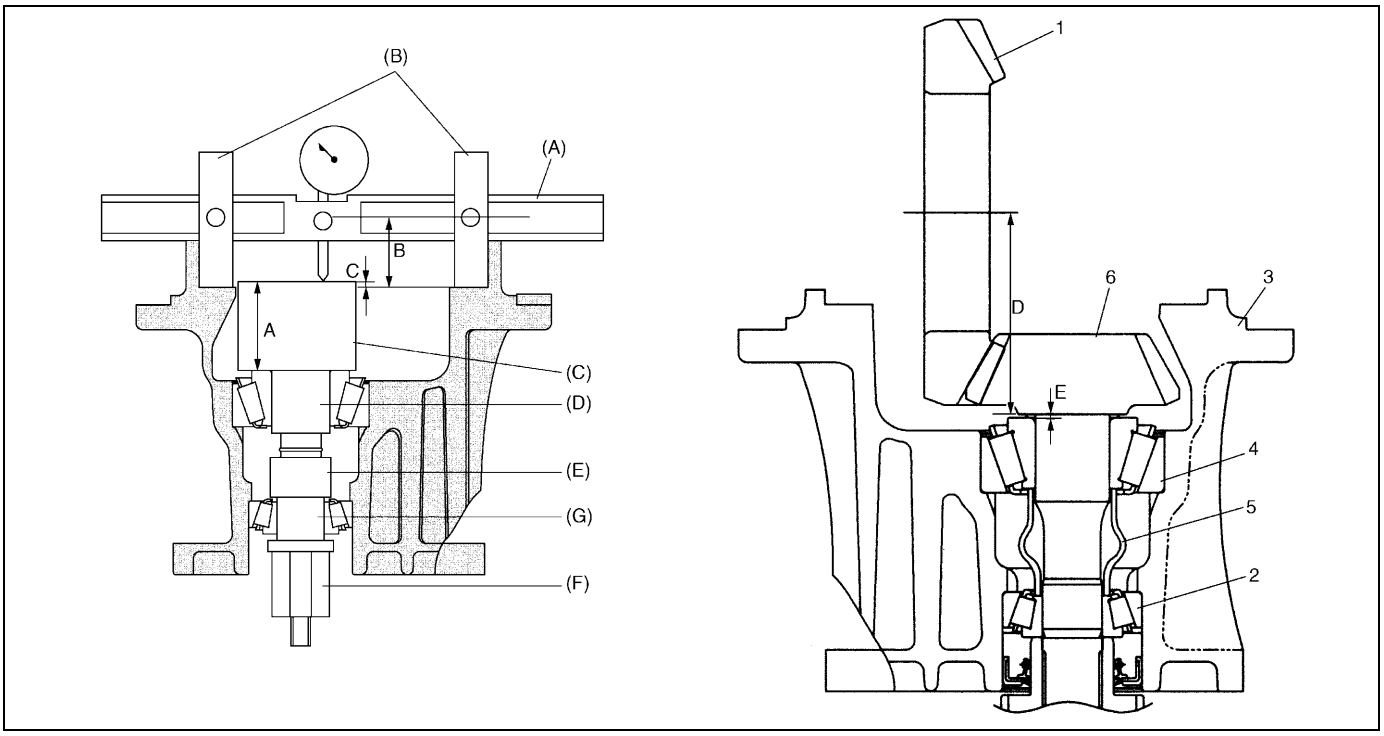
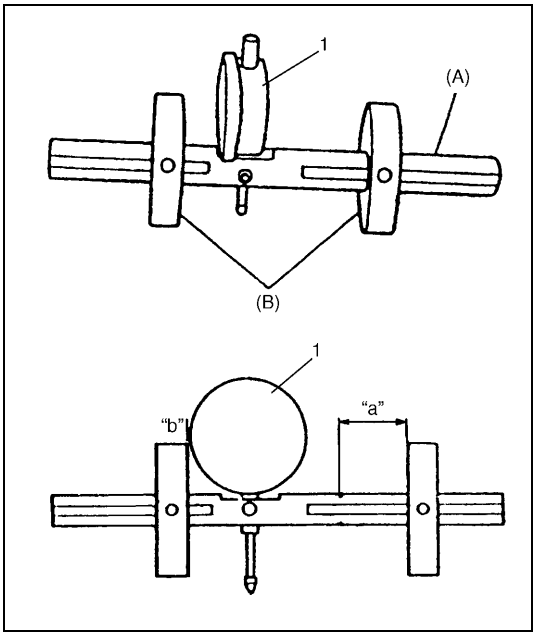
Differential Carrier



A: Dummy height of pinion from dummy 40 mm/1.757 in.	D: Drive bevel pinion mounting distance 68.00mm/2.677 in.	3. Differential carrier
B: Radius of bearing from dummy with dummy shaft 31 mm/ 1.220 in.	E: Shim thickness for mounting distance adjustment (E = 3 mm (0.118 in.) – C)	4. Rear bearing
A+B: Mounting distance adjusting dummy total size 71.00mm/ 2.795 in.	1. Drive bevel gear	5. Spacer
C: Measured dimension	2. Front bearing	6. Drive bevel pinion

Special tool
(A) : 09922-76120
(B) : 09922-76250
(C) : 09922-76140
(D) : 09922-76430
(E) : 09922-76330
(F) : 09922-76150
(G) : 09922-76350



1) Set special tools and make drive bevel pinion mounting dummy.

Special tool
(A) : 09922-76120
(B) : 09922-76250

2) Install dial gauge (1) to mounting dummy as shown in figure.

Special tool set distance
"a" : 25.0 mm (0.984 in.)
"b" : 0 mm (0.000 in.)

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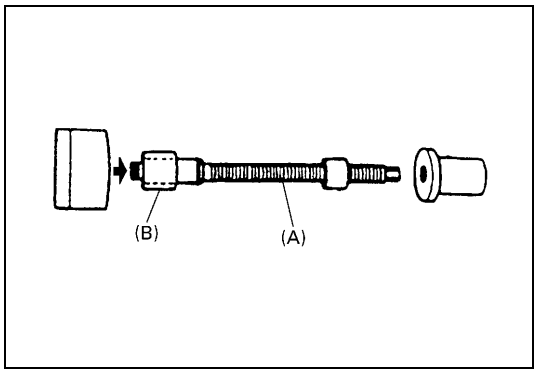
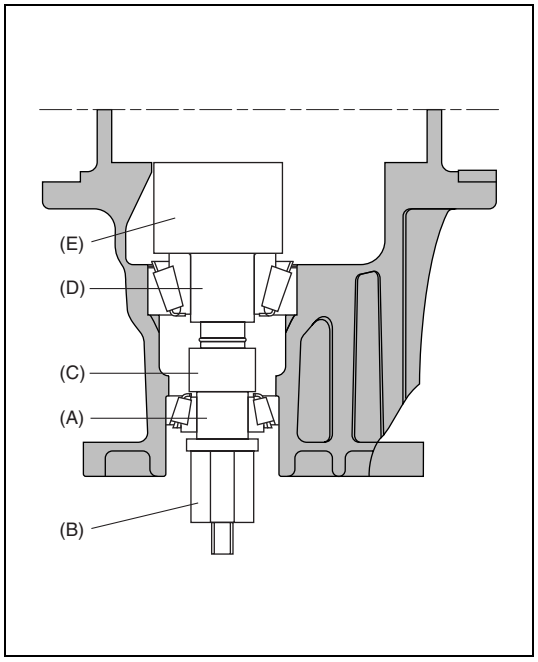


3) Set special tools and make drive bevel pinion dummy.

Special tool
(A) : 09922-76140
(B) : 09922-76430

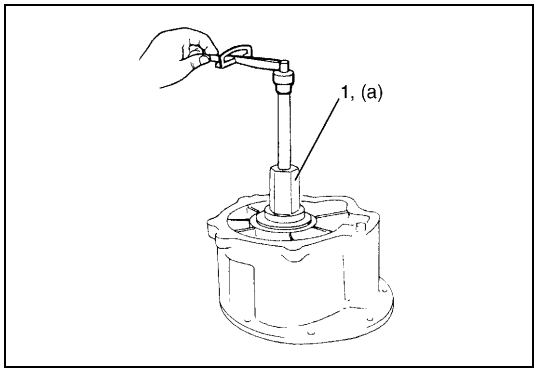


4) Apply gear oil to drive bevel pinion bearing, install bearing to bevel pinion dummy and then install bevel pinion dummy to differential carrier.
5) Apply gear oil to drive bevel pinion bearing, install bearing to special tool.
Then install them with another special tool to bevel pinion dummy.

Special tool
(A) : 09922-76350
(B) : 09922-76150
(C) : 09922-76330
(D) : 09922-76430
(E) : 09922-76140

NOTE:

This installation requires no spacer or oil seal.

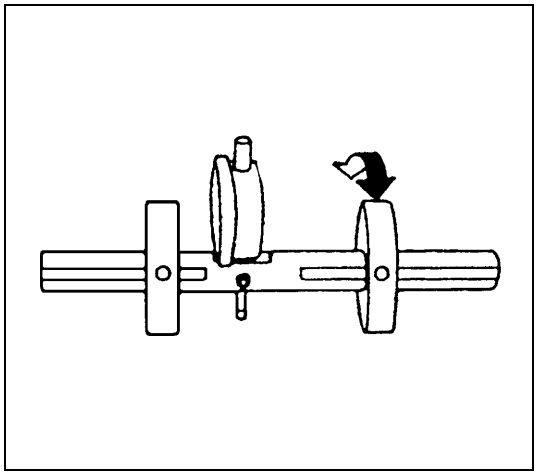


6) Tighten bevel pinion nut (special tool) (1) so that specified bearing preload is obtained.

NOTE:

Before taking measurement, check for rotation by hand more than 15 revolutions.

Pinion bearing preload (at 50 r/min)
(a) : 5.0 – 13.0 kg-cm (4.4 – 11.2 lb-in.)



7) Set dial gauge to bevel pinion mounting dummy and make 0 (zero) adjustment on surface plate.

NOTE:

- **When setting dial gauge to mounting dummy, tighten screw lightly. Be careful not to overtighten it, which will cause damage to dial gauge.**
- **With dial gauge set, turn dummy back and forth by hand a couple of times and attain accurate 0 (zero) adjustment.**

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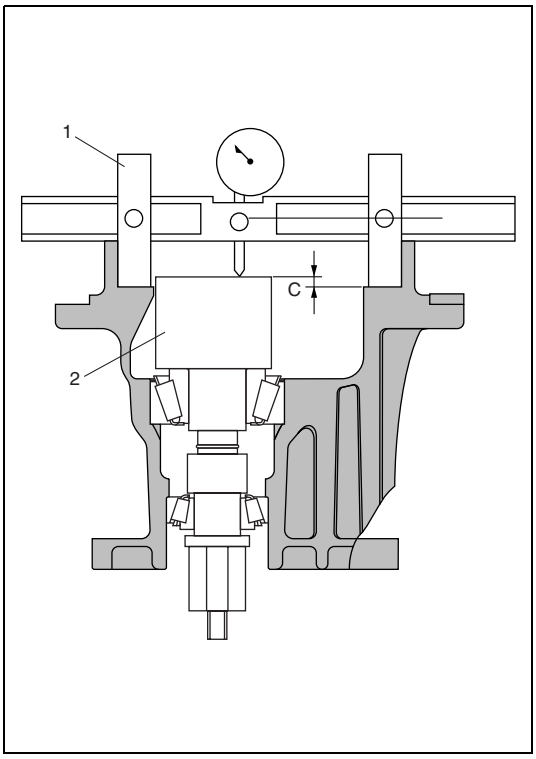


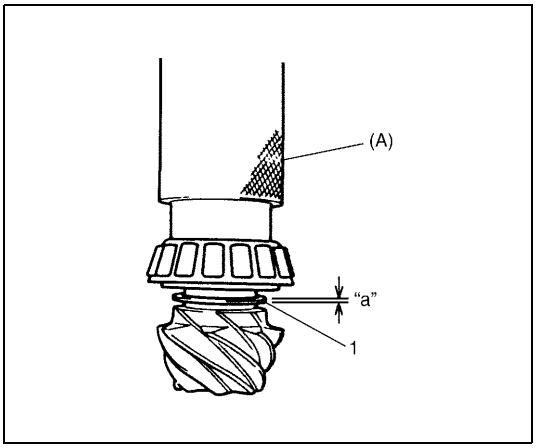
8) Place zero-adjusted mounting dummy (1) and dial gauge set on pinion dummy (2) and take measurement between zero position and extended dial gauge measuring tip.

NOTE:

- **Repeat turning back and forth of dummy and measure distance as far as top surface of pinion dummy accurately.**
- **When dial gauge measuring tip extends from 0 (zero) position, pointer turns counterclockwise.**
- **Measured value may exceed 1 mm. Therefore, it is also necessary to know reading of short pointer.**

9) Obtain adjusting shim thickness by using measured value by dial gauge in the following equation.

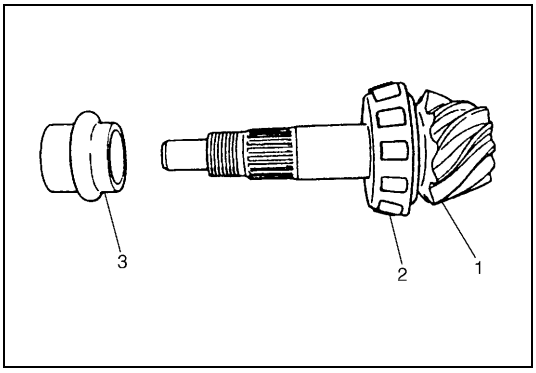
Necessary shim thickness	=	3 mm/0.118 in. (Adjusting dummy total size – Drive bevel pinion mounting distance)	–	Dial gauge measured value C



10) Select adjusting shim(s) (1) closest to calculated value from among following available sizes and put it in place and then press-fit rear bearing.

Special tool
(A) : 09913-80112

Available shim thickness
"a" : 0.30, 1.00, 1.03, 1.06, 1.09, 1.12, 1.15, 1.18, 1.21, 1.24, 1.27, and 1.30 mm (0.012, 0.039, 0.041, 0.042, 0.043, 0.044, 0.045, 0.046, 0.048, 0.049, 0.050 and 0.051 in.)



11) With new pinion spacer (3) inserted as shown, install front bearing to differential carrier.

NOTE:

- **Make sure to use new spacer for reinstallation.**
- **Apply oil to bearings.**

1. Drive bevel pinion
2. Rear bearing

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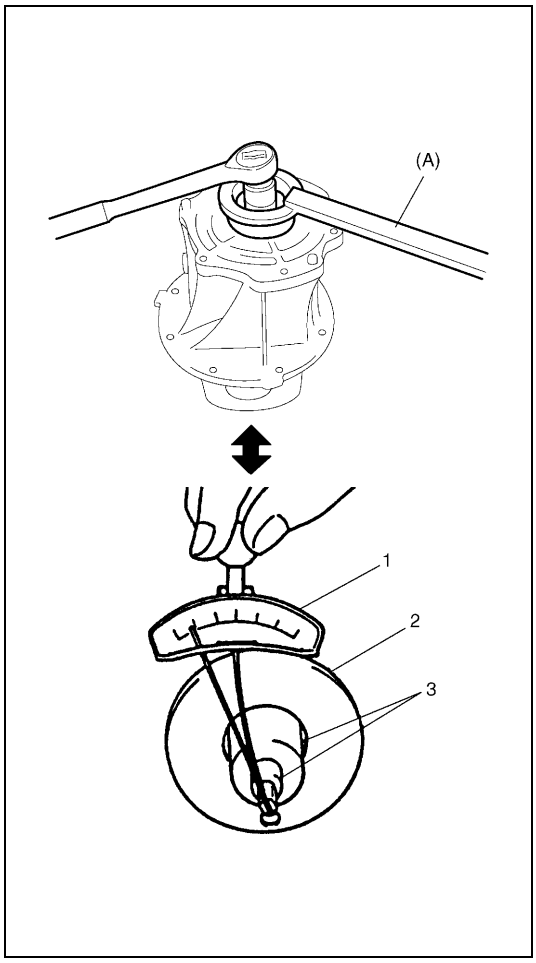


12) While tightening bevel pinion nut gradually with bevel pinion holder (special tool), set preload of pinion to specification.

NOTE:

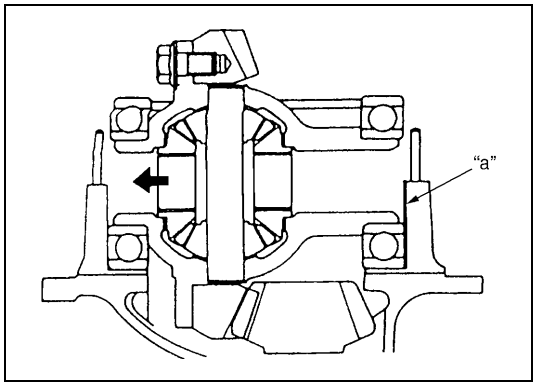
- **Before taking measurement, check for smooth rotation by hand.**
- **Bevel pinion bearing preload is adjusted by tightening bevel pinon nut to deform spacer.**
  Therefore, be sure to use a new spacer for adjustment and tighten pinion nut step by step and check for starting torque (preload) as often as tightening to prevent over crushing of spacer.
  If exceeds specification given below during adjustment, replace spacer and repeat preload adjustment procedure. Attempt to decrease starting torque (preload) by loosening pinon nut will not do.

Pinion bearing preload
: 5.0 – 13.0 kg-cm (4.4 – 11.2 lb-in.)

Special tool
(A) : 09927-28010

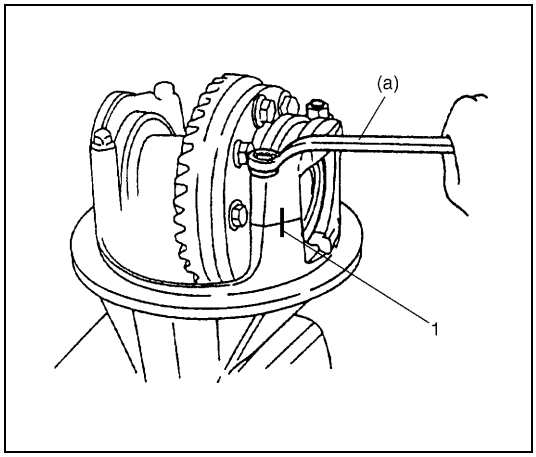
1. Torque wrench
2. Differential input hub
3. Socket with adapter

Differential Assembly



1) Place differential gear case assembly to differential carrier, push differential case to left side as shown in figure.
   Then measure clearance "a" between side bearing and differential carrier by using thickness gauge.
   Select shims closest to measured value.

Available shim thickness
: 1.35,1.40,1.45, 1.50, 1.55, 1.60, 1.65, 1.70 and 1.75 mm (0.0531, 0.0551, 0.0571, 0.0591, 0.0610, 0.0630, 0.0650, 0.669 and 0.0689 in.)



2) Divide selected shim(s) between both sides (right and left) and install them to differential carrier. Then install differential side bearing cap.

Tightening torque
Differential side bearing cap bolts
(a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

NOTE:

- **Align match marks (1) on cap and carrier.**
- **Apply gear oil to bearing.**

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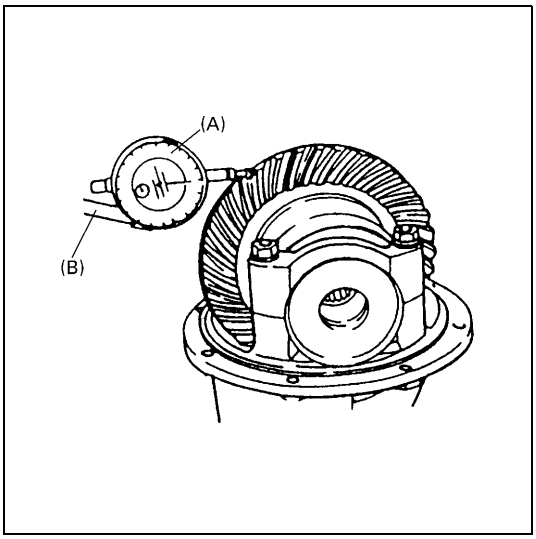


3) Measure backlash by using dial gauge.

Drive bevel gear backlash
: 0.10 – 0.20 mm (0.0039 – 0.0078 in.)

NOTE:

- **Be sure to apply measuring tip of dial gauge at right angles to convex side (drive side) of tooth.**
- **If backlash is out of specification, change division of shims so that backlash is within specification.**

Special tool
(A) : 09900-20606
(B) : 09900-20701

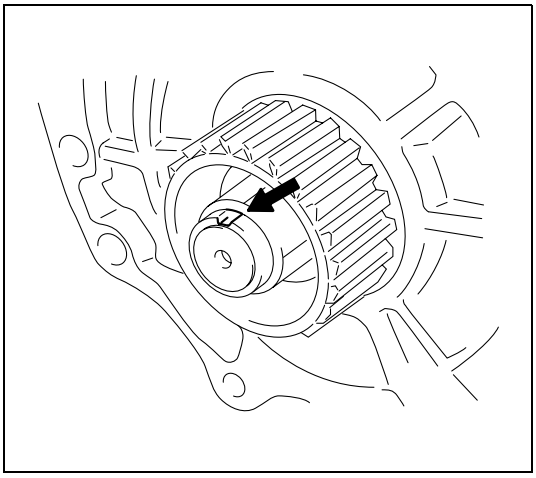
4) Check gear tooth contact as follows.
   a) After cleaning tooth surface of drive bevel gears, paint them with gear marking compound evenly by using brush or sponge etc.

CAUTION:
When applying red lead paste to teeth, be sure to paint tooth surfaces uniformly. The paste must not be too dry or too fluid.

   b) Turn gear to bring its painted part in mesh with bevel pinion and turn it back and forth by hand to repeat their contact.
   c) Bring painted part up and check contact pattern, referring to the following chart. If contact pattern is not normal, readjust or replace as necessary according to instruction in chart.

NOTE:

Be careful not to turn bevel gear more than one full revolution, for it will hinder accurate check.



5) After completing of gear tooth contact check caulk bevel pinion nut with caulking tool and hammer.

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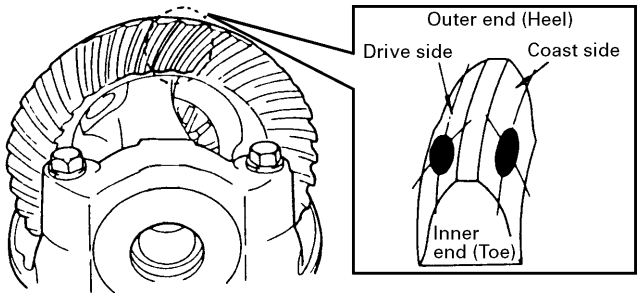
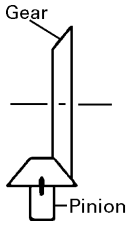
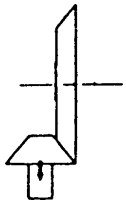
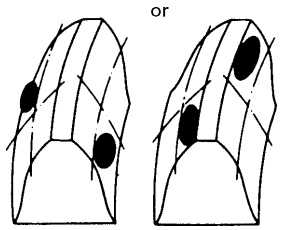
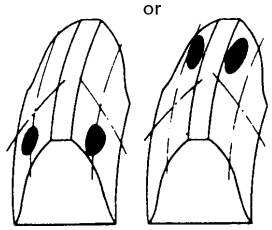
TOOTH CONTACT PATTERN	DIAGNOSIS AND REMEDY
	NORMAL
	HIGH CONTACT Pinion is positioned too fat from the center of drive bevel gear. 1) Increase thickness of pinion height adjusting shim and position pinion closer to gear center. 2) Adjust drive bevel gear backlash to specification. 
	LOW CONTACT Pinion is positioned too close to the center of drive bevel gear. 1) Decrease thickness of pinion height adjusting shim and position pinion farther from gear center. 2) Adjust drive bevel gear backlash to specification. 
	These contact patterns indicate that the “offset” of differential is too much or too little. The remedy is to replace the carrier with a new one.
	These contact patterns, located on toe or heel on both drive and coast sides, mean that 1) both pinion and gear are defective, 2) carrier is not true and square, or 3) gear is not properly seated on differential case. The remedy is to replace the defective member.

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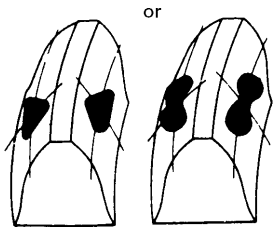
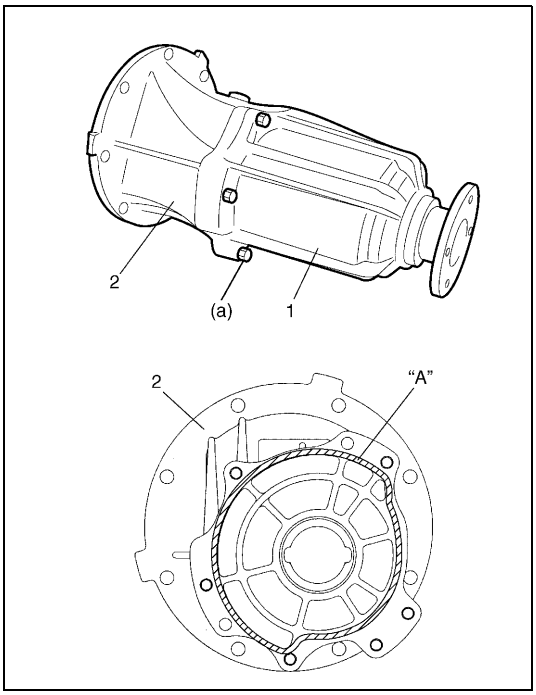
TOOTH CONTACT PATTERN	DIAGNOSIS AND REMEDY
	Irregular patterns: If the pattern is not oval, it means that bevel gear is defective. High or low spots on tooth surfaces or on the seat of bevel gear are the cause of irregular patterns appearing on some teeth. The remedy is to replace the pinion and-gear set and, if the seat is defective, so is transfer case.

UNIT ASSEMBLY



Before installing viscous coupling case (1) to differential carrier (2), clean mating surfaces of viscous coupling case and differential carrier, then apply sealant to differential carrier (2) by using a nozzle as shown in figure by such amount that its section is 1.5mm (0.059 in.) in diameter.

"A" : Sealant 99000-31110

Tightening torque
Coupling case bolts (a) : 25 N·m (2.5 kg-m, 18.0 lb-ft)

TIGHTENING TORQUE SPECIFICATION

Fastening part	Tightening torque		
	N•m	kg-m	lb-ft
Rear differential oil drain plug	55	5.5	40.0
Rear differential oil level/filler plug	50	5.0	36.5
Rear differential companion flange nut	130	13.0	94.0
Rear differential input flange bolts	23	2.3	17.0
Drive bevel gear bolts	80	8.0	58.0
Differential side bearing cap bolts	23	2.3	17.0
Coupling case bolts	25	2.5	18.0
Differential carrier bolts	23	2.3	17.0
Propeller shaft bolts	23	2.3	17.0

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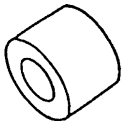
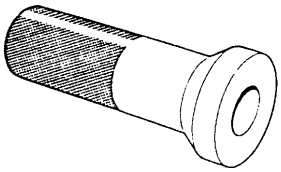
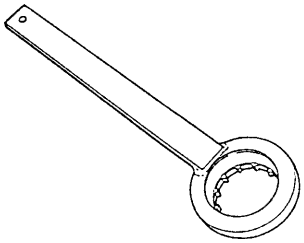
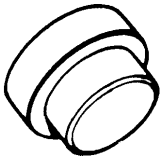
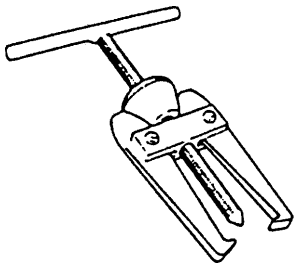
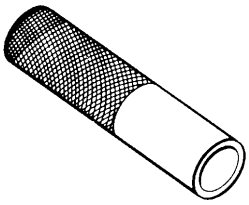
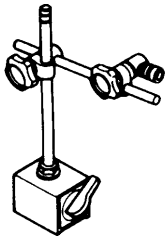
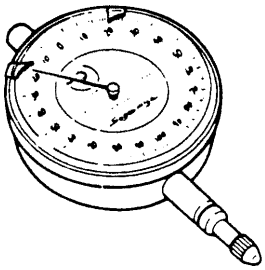
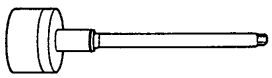
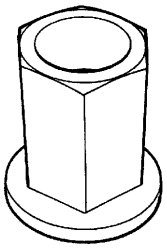
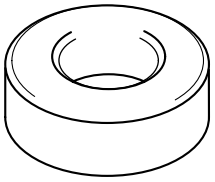
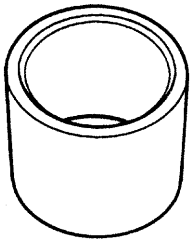
REQUIRED SERVICE MATERIAL

Material	Recommended SUZUKI product (Part Number)	Use
Thread lock cement	THREAD LOCK CEMENT 1322 (99000-32110)	Bevel gear bolts
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	Oil seal lips
Sealant	SUZUKI BOND NO. 1215 (99000-31110)	• Thread part of differential carrier bolt • Mating surface of differential housing • Mating surface of rear axle housing • Mating surface of viscous coupling case

SPECIAL TOOL

 09951-16060 Lower arm bush remover	 09951-76010 Bearing installer	 09927-28010 Bevel pinion holder	 09925-88210 Bearing puller attachment
 09913-60910 Bearing puller	 09913-80112 Bearing installer	 09900-20701 Magnetic stand	 09900-20606 Dial gauge
 09922-76140 Bevel pinion shaft	 09922-76150 Bevel pinion nut	 09922-76330 Rear collar	 09922-76430 Front collar

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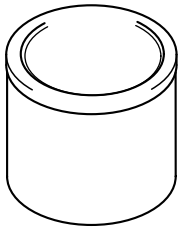
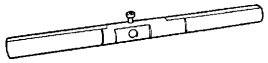
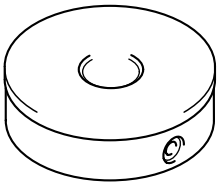
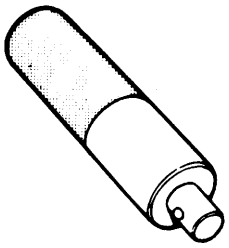
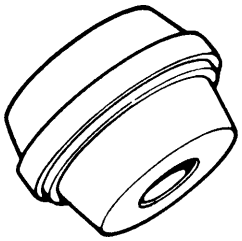
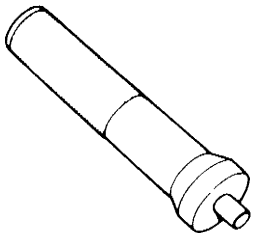
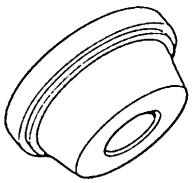
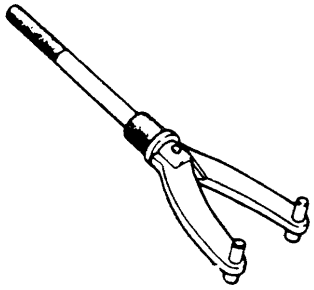
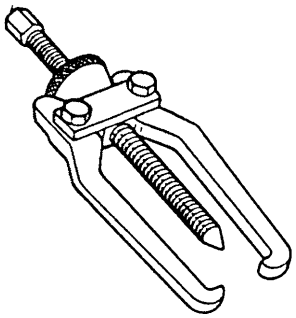
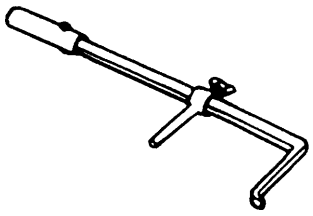
 09922-76350 Gauge block	 09922-76120 Dummy shaft	 09922-76250 Bevel gear dummy	 09924-74510 Bearing installer handle
 09925-68210 Bearing installer	 09925-98210 Bearing installer	 09924-84510-002 Bearing installer	 09930-40113 Flange holder
 09913-65135 Bearing puller	 09913-50121 Oil seal remover		

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SECTION 8

BODY ELECTRICAL SYSTEM

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System :

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

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DIAGNOSIS

NOTE:

Fuse name (“ ”) in the table below is shown on the fuse box cover.

HEADLIGHT

Condition	Possible Cause	Correction
Headlights do not light up	Lighting or dimmer switch faulty	Check headlight switch.
	Headlight R and L fuses blown	Replace fuse to check for short.
	Wiring or grounding faulty	Repair circuit.
Only one headlight does not light up	Bulb blown	Replace bulb.
	Headlight R or L fuse blown	Replace fuse to check for short.
	Wiring or grounding faulty	Repair circuit.
Only one beam (“Hi” or “Lo”) does not light	Bulb blown	Replace bulb.
	Lighting or dimmer switch faulty	Check switch.
	Wiring or grounding faulty	Repair circuit.

HEADLIGHTS WITH LEVELING SYSTEM (IF EQUIPPED)

Condition	Possible Cause	Correction
Both headlights do not move	“WIPER/WASHER” fuse blown	Replace fuse to check for short.
	Leveling switch faulty	Check switch.
	Supply voltage too low	Recharge or replace battery.
One of headlights (either Right or Left) does not move	Socket, wiring or grounding faulty	Repair.
	Actuator faulty	Check actuator.
	Vehicle body around headlight deformed	Repair body.
	Headlight assembly itself deformed	Replace headlight assembly.

TURN SIGNAL AND HAZARD WARNING LIGHT

Condition	Possible Cause	Correction
Flash rate high or one side only flashes	Bulb blown on “flash rate high”-side	Replace bulb.
	Incorrect bulb	Replace bulb.
	Turn signal/hazard warning relay faulty	Check relay.
	Open circuit or high resistance existing between combination switch (turn signal/hazard warning switch) and light on one side	Repair circuit.
	Wiring or grounding faulty	Repair circuit.
No flashing	“HORN HAZARD” fuse and/or “TURN/BACK” fuse(s) blown	Replace fuse(s) to check for short.
	Open circuit or high resistance existing between battery and switch	Repair circuit.
	Turn signal/hazard relay faulty	Check relay.
	Combination switch or hazard switch faulty	Check switch.
	Wiring or grounding faulty	Repair circuit.
Flash rate low	Supply voltage low	Check charging system.
	Turn signal/hazard relay faulty	Check relay.

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CLEARANCE, TAIL AND LICENSE PLATE LIGHT

Condition	Possible Cause	Correction
All lights do not light up	"TAIL" fuse blown	Replace fuse to check for short.
	Combination switch (lighting and dimmer switch) faulty	Check switch.
	Wiring or grounding faulty	Repair circuit.
Some lights do not light up	Bulb(s) blown	Replace bulb(s).
	Wiring or grounding faulty	Repair circuit.

BACK-UP LIGHT

Condition	Possible Cause	Correction
Back-up lights do not light up	Bulb(s) blown	Replace bulb(s).
	"TURN/BACK" fuse blown	Replace fuse to check for short.
	Back-up light switch faulty	Check switch.
	Wiring or grounding faulty	Repair circuit.
Back-up lights stay on	Back-up light switch faulty	Check or replace switch.

BRAKE LIGHT

Condition	Possible Cause	Correction
Brake lights do not light up	Bulb(s) blown	Replace bulb(s).
	"STOP" fuse blown	Replace fuse to check for short.
	Brake light (stop lamp) switch faulty	Check switch.
	Wiring or grounding faulty	Repair circuit.
Brake lights stay on	Brake light (stop lamp) switch faulty	Check, adjust or replace switch.

FRONT FOG LIGHT (IF EQUIPPED)

Condition	Possible Cause	Correction
Only one light does not light	Bulb blown	Replace bulb.
	Wiring or grounding faulty	Repair circuit.
Front fog lights do not light	"FOG" fuse blown	Replace fuse to check for short.
	Front fog light switch faulty	Check switch.
	Front fog light relay faulty	Replace relay.
	Wiring or grounding faulty	Repair circuit.

REAR FOG LIGHT (IF EQUIPPED)

Condition	Possible Cause	Correction
Rear fog light does not come on	"FOG" fuse blown	Replace fuse to check for short.
	Rear fog light switch faulty	Check fog light switch.
	Lighting switch faulty	Check switch.
	Wiring or grounding faulty	Repair circuit.
	Bulb blown	Replace bulb.

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SPEEDOMETER AND VSS

Condition	Possible Cause	Correction
Speedometer shows no operation or incorrect operation	"IG/METER" and/or "RADIO/DOME" fuse(s) blown	Replace fuse(s) to check for short.
	VSS faulty	Check VSS.
	Printed plate in combination meter faulty	Check printed plate.
	Wiring or grounding faulty	Repair circuit.
	Signal rotor on differential case faulty	Check signal rotor.
	Speedometer faulty	Replace speedometer.

FUEL METER AND FUEL LEVEL SENSOR (GAUGE UNIT)

Condition	Possible Cause	Correction
Fuel meter shows no operation or incorrect operation	"IG/METER" fuse blown	Replace fuse to check for short.
	Fuel gauge unit faulty	Check fuel gauge unit.
	Printed plate in combination meter faulty	Check printed plate.
	Fuel meter faulty	Check fuel meter.
	Wiring or grounding faulty	Repair circuit.

ENGINE COOLANT TEMPERATURE (ECT) METER AND ECT SENSOR

Condition	Possible Cause	Correction
Engine coolant temp. meter shows no operation or incorrect operation	"IG/METER" fuse blown	Replace fuse to check for short.
	ECT meter faulty	Check ECT meter.
	Printed plate in combination meter faulty	Check printed plate.
	ECT sensor faulty	Check ECT sensor.
	Wiring or grounding faulty	Repair circuit.

OIL PRESSURE WARNING LIGHT

Condition	Possible Cause	Correction
Oil pressure warning light does not light up when turn the ignition switch to ON position at engine off	Bulb in combination meter blown	Replace bulb.
	"IG/METER" fuse blown	Replace fuse to check for short.
	Printed plate in combination meter faulty	Check printed plate.
	Oil pressure switch faulty	Check oil pressure switch.
	Wiring or grounding faulty	Repair circuit.
Oil pressure warning light stay on	Oil pressure switch faulty	Check oil pressure switch.

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BRAKE AND PARKING BRAKE WARNING LIGHT

Condition	Possible Cause	Correction
Brake warning light does not light up (when fluid low level and/or parking brake pull up)	Bulb in combination meter blown	Replace bulb.
	Printed plate in combination meter faulty	Check printed plate.
	"IG/METER" fuse blown	Replace fuse to check for short.
	Brake fluid level switch faulty	Check brake fluid level switch.
	Parking brake switch faulty	Check parking brake switch.
	Wiring or grounding faulty	Repair circuit.
Brake warning light does not light up when cranking (when turned ignition switch to ST position)	Ignition switch faulty	Check ignition switch.
	Printed plate in combination meter faulty	Check printed plate.
	Wiring or grounding faulty	Repair circuit.
Brake warning light stay on	Brake fluid level switch and/or parking brake switch faulty	Check switch.

REAR WINDOW DEFOGGER

Condition	Possible Cause	Correction
Defogger does not operate	"REAR DEFG" fuse blown	Replace fuse to check for short.
	Heat wire faulty	Repair heat wire.
	Rear window defogger switch faulty	Check switch.
	Wiring or grounding faulty	Repair circuit.

WIPERS AND WASHERS

FRONT WIPER AND WASHER

REAR WIPER AND WASHER (IF EQUIPPED)

Condition	Possible Cause	Correction
Wiper malfunctions	"WIPER/WASHER" fuse blown	Replace fuse to check for short.
	Wiper motor faulty	Check wiper motor.
	Combination switch (wiper switch) faulty	Check wiper switch.
	Wiring or grounding faulty	Repair circuit.
Washer malfunctions	Washer hose or nozzle clogged	Clean or repair clogged hose or nozzle.
	"WIPER/WASHER" fuse blown	Replace fuse to check for short.
	Washer motor faulty	Check washer motor.
	Combination switch (wiper switch) faulty	Check wiper switch.
	Wiring or grounding faulty	Repair circuit.

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POWER WINDOW CONTROL SYSTEM (IF EQUIPPED)

Condition	Possible Cause	Correction
All power windows do not operate	"POWER WINDOW" fuse blown	Replace fuse to check for short.
	Ignition switch faulty	Check ignition switch.
	Power window main switch faulty	Check power window main switch.
	Wiring or grounding faulty	Repair circuit.
Only one power window does not operate	Wiring and/or coupler faulty	Check wiring and/or coupler.
	Power window switch (main or sub) faulty	Check power window switch.
	Window actuator faulty	Check window actuator.
	Grounding faulty	Repair.

CIGARETTE LIGHTER

Condition	Possible Cause	Correction
Cigarette lighter shows no operation	"CIGAR" fuse blown	Replace fuse to check for short.
	Ignition switch faulty	Check ignition switch.
	Cigarette lighter faulty	Check cigarette lighter.
	Wiring or grounding faulty	Repair circuit.

POWER DOOR LOCK CONTROL SYSTEM (IF EQUIPPED)

Condition	Possible Cause	Correction
Power door(s) is (are) not locked/unlocked by driver side door key switch	"DOOR LOCK" fuse blown	Replace fuse to check for short.
	Ignition switch faulty	Check ignition switch.
	Driver's door knob switch faulty	Check driver's door knob switch.
	Door lock actuator faulty	Check door lock actuator.
	Wiring or grounding faulty	Repair circuit.
	Door lock controller faulty	Check controller.

KEYLESS ENTRY SYSTEM (IF EQUIPPED)

Condition	Possible Cause	Correction
Power door(s) is (are) not locked/unlocked by keyless entry transmitter	"DOOR LOCK" fuse blown	Replace fuse to check for short.
	Ignition switch faulty	Check ignition switch.
	Code registration error	Register code.
	Transmitter battery dead	Replace battery.
	Transmitter faulty	Check transmitter.
	Receiver faulty	Check receiver.
	Door lock controller faulty	Check controller.
	Wiring or grounding faulty	Repair circuit.

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POWER DOOR MIRROR CONTROL SYSTEM (IF EQUIPPED)

Condition	Possible Cause	Correction
All power mirrors do not operate	"CIGAR" fuse blown	Replace fuse to check for short.
	Power door mirror switch faulty	Check switch.
	Wiring or grounding faulty	Repair circuit.
One power mirror does not operate	Power door mirror switch faulty	Check switch.
	Actuator (power door mirror motor) faulty	Check actuator.
	Wiring or grounding faulty	Repair circuit.

INTERIOR LIGHT

Condition	Possible Cause	Correction
Interior lights do not light up	Bulbs blown	Replace bulbs.
	"RADIO/DOME" fuse blown	Replace fuse to check for short.
	Interior light switch faulty	Check switch.
	Door switch faulty	Check switch.
	Wiring or grounding	Repair circuit.
One of interior light does not light up	Bulb blown	Replace bulb.
	Interior light switch faulty	Check switch.
	Door switch faulty	Check switch.
	Wiring or grounding	Repair circuit.

HORN

Condition	Possible Cause	Correction
Horn does not operate	"HORN/HAZARD" fuse blown	Replace fuse to check for short.
	Horn switch faulty	Check horn switch.
	Horn relay faulty	Check horn relay.
	Horn faulty	Replace horn.

IGNITION KEY REMAINDER (IF EQUIPPED) AND LIGHT REMAINDER WARNING BUZZER

Condition	Possible Cause	Correction
Ignition key remainder and light remainder warning buzzer shows no sounding	Buzzer faulty	Replace buzzer.
	Wiring or grounding faulty	Repair circuit.
	Driver side door switch faulty	Check door switch.
	Ignition switch faulty	Check ignition switch.

SEAT BELT WARNING LIGHT (IF EQUIPPED)

Condition	Possible Cause	Correction
Seat belt warning light does not light up	Bulb in combination meter blown	Replace bulb.
	"IG/METER" fuse blown	Replace fuse to check for short.
	Seat belt switch faulty	Check seat belt switch.
	Wiring or grounding faulty	Repair circuit.

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FRONT SEAT HEATER (IF EQUIPPED)

Condition	Possible Cause	Correction
Both seat back and cushion do not become hot although seat heater switch is LO/HI position	"SEAT HTR" fuse blown	Replace fuse to check for short.
	Seat heater switch faulty	Check switch.
	Seat heater circuit in seat back and/or seat cushion faulty	Check heater front back and/or heater front cushion.
	Wiring or grounding faulty	Repair circuit.
Only seat back does not become hot although seat heater switch is HI position	Seat heater circuit in seat back faulty	Check heater front back.
	Seat heater switch faulty	Check switch.
	Wiring faulty	Repair.
Only seat cushion does not become hot although seat heater switch is HI position	Seat heater circuit in seat back and/or seat cushion faulty	Check heater front back and/or heater front cushion.
	Seat heater switch faulty	Check switch.
	Wiring faulty	Repair.

ON-VEHICLE SERVICE

CAUTIONS IN SERVICING

When performing works related to electric systems, observe the cautions described in GENERAL INFORMATION (Section 0A) of this manual for the purpose of protection of electrical parts and prevention of a fire from occurrence.

HEADLIGHT

HEADLIGHT SWITCH

REMOVAL AND INSTALLATION

Refer to "CONTACT COIL AND COMBINATION SWITCH ASSEMBLY" in Section 3C.

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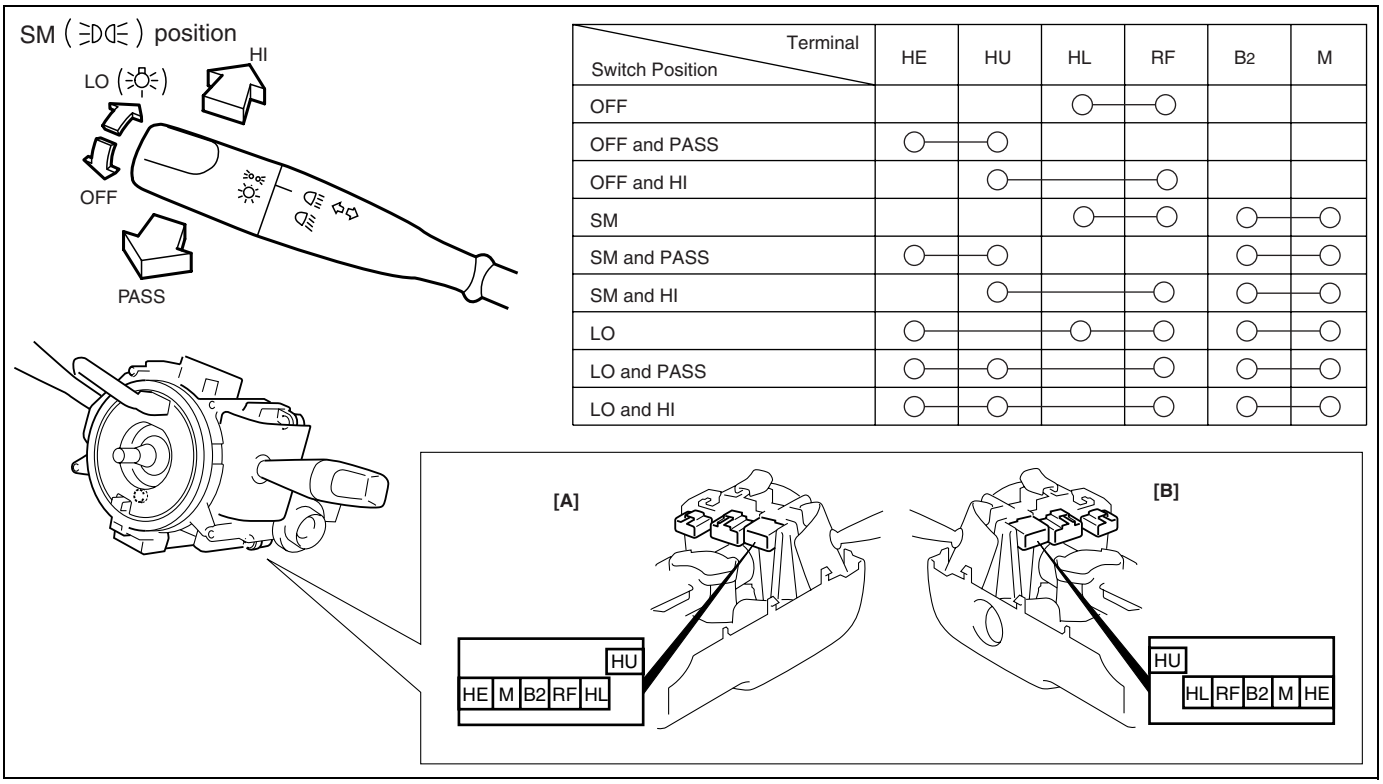
INSPECTION

Check for continuity between terminals at each switch position as shown below. If check result is not as specified, replace.

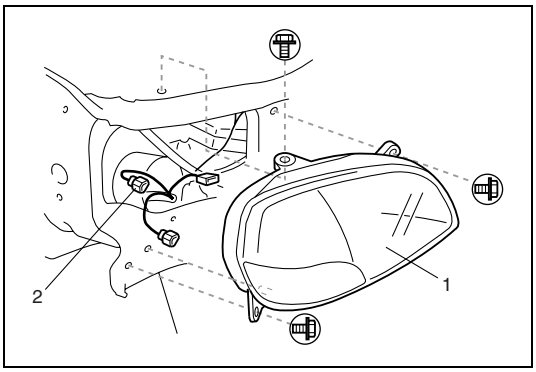


Terminal / Switch Position	HE	HU	HL	RF	B2	M
OFF			○	○		
OFF and PASS	○	○				
OFF and HI		○		○		
SM			○	○	○	○
SM and PASS	○	○			○	○
SM and HI		○		○	○	○
LO	○		○	○	○	○
LO and PASS	○	○		○	○	○
LO and HI	○	○		○	○	○

[A] : LH steering vehicle
[B] : RH steering vehicle

HEADLIGHT ASSEMBLY

REMOVAL



1) Disconnect negative cable at battery.
2) Remove front bumper. Refer to Section 9.
3) Remove headlight mounting bolts.
4) Detach headlight assembly (1) from vehicle.
5) Disconnect couplers (2) from headlight assembly (1).

INSTALLATION

Reverse removal procedure for installation.

HEADLIGHT BULB

REPLACEMENT

WARNING:

- **To avoid danger of being burned, don't touch when the bulb is hot.**
- **Don't touch glass surface of bulb, to avoid deteriorate as the case may be unclear when bulb light on at dirty condition.**

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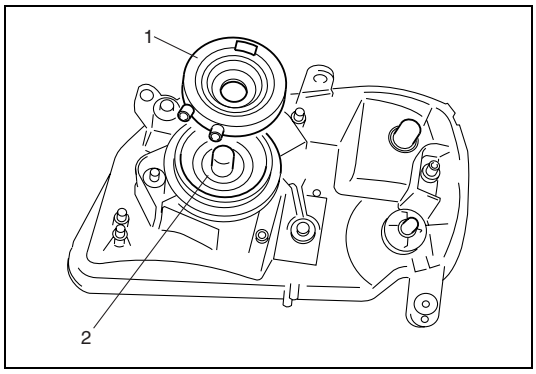
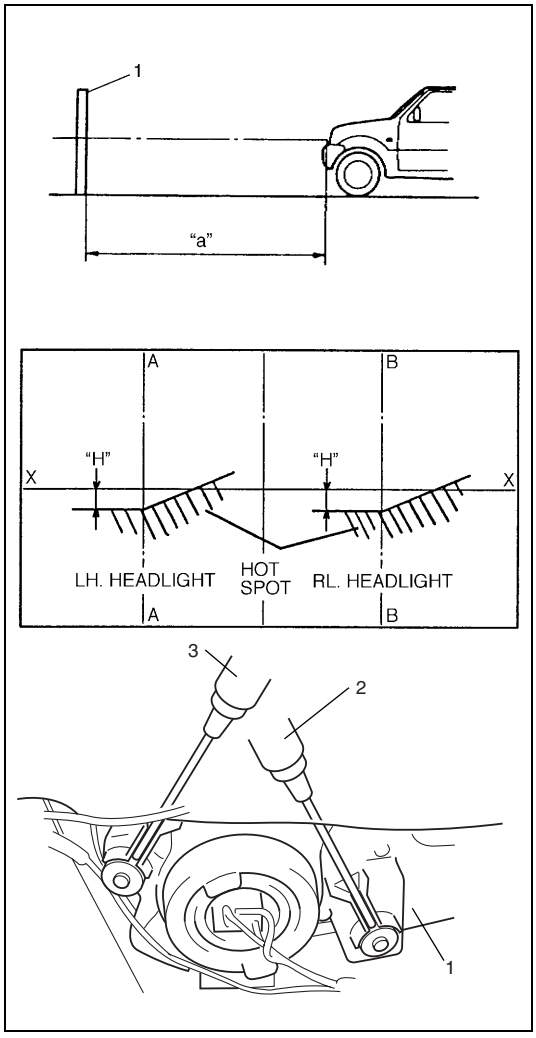


1) Disconnect negative cable at battery.
2) Disconnect coupler from bulb.
3) Remove socket cover (1).
4) Replace bulb (2) and assemble all removed parts.

HEADLIGHT AIMING ADJUSTMENT WITH SCREEN

NOTE:

- **Unless otherwise obligated by local regulations, adjust headlight aiming according to following procedure.**
- **After replacing headlight, be sure to adjust aiming.**



1) Make sure the following items.
   - Place vehicle on a flat surface in front of blank wall (screen) (1) ahead of headlight surface.

   Distance between screen and headlight
   "a" : 10 m (32.8 ft.)

   - Adjust air pressure of all tires to a specified value respectively.
   - Bounce vehicle body up and down by hand to stabilize suspension.
   - Carry out with one driver aboard.

   Driver's weight
   : 75 kg (165 lb)

2) Check to see if hot spot (high intensity zone) of each main (low) beam axis falls as shown in figure.

   Hot spot specification
   "H" : Approx. 130 mm (5.15 in.)

3) Align headlight aiming to specification by adjusting aiming screw and aiming gear if it is not set properly.

1.	Headlight assembly
2.	Aiming (for up/down adjustment)
3.	Aiming (for right/left and up/down adjustment)
X-X :	Horizontal center line of headlights bulb
A-A :	Vertical center line of left headlight bulb
B-B :	Vertical center line of right headlight bulb

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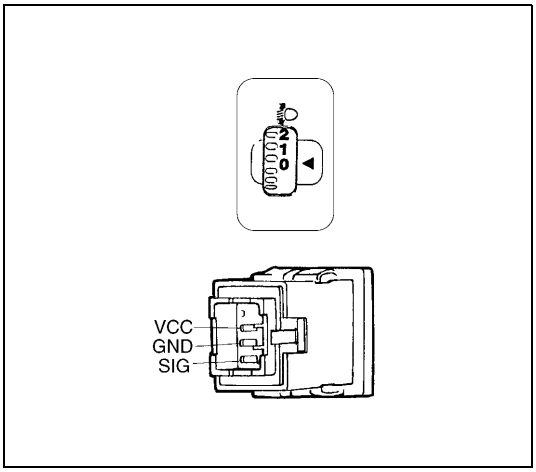
HEADLIGHT LEVELING SWITCH (IF EQUIPPED)

INSPECTION



Check for resistance between terminals at each switch position as shown below. If check result is not as specified, replace.

Headlight leveling switch resistance

Position	Terminals	Resistance (KΩ)
–	VCC and GND	4.3 - 4.9
0	SIG and GND	3.7 - 4.1
1		3.1 - 3.4
2		2.4 - 2.7
3		1.7 - 2.0
4		1.1 - 1.3

TURN SIGNAL AND HAZARD WARNING LIGHTS

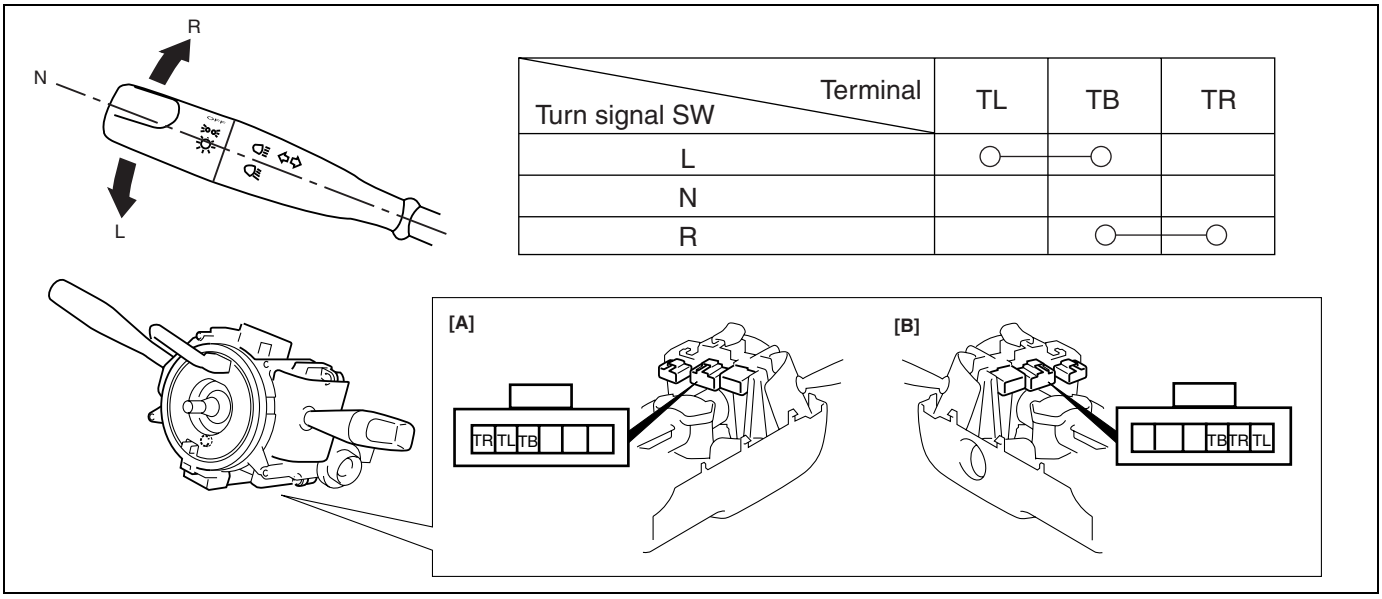
TURN SIGNAL LIGHT SWITCH

REMOVAL AND INSTALLATION

Refer to “CONTACT COIL AND COMBINATION SWITCH ASSEMBLY” in Section 3C.

INSPECTION

Check for continuity between terminals at each switch position as shown below. If check result is not as specified, replace.



[A] : LH steering vehicle
[B] : RH steering vehicle

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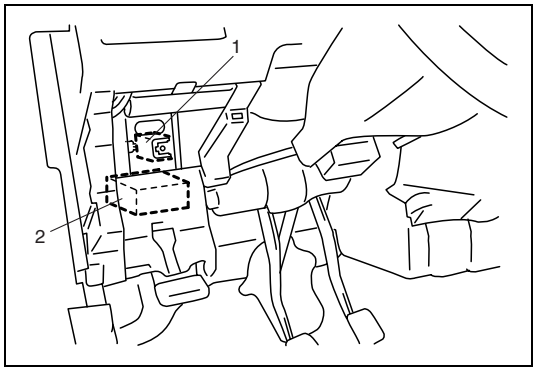
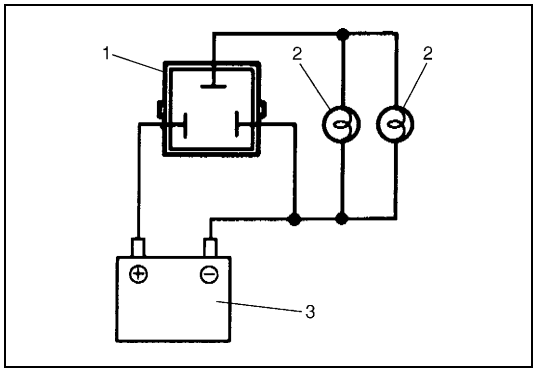
TURN SIGNAL AND HAZARD RELAY



The turn signal and hazard relay (1) is located near the fuse box (2).

INSPECTION

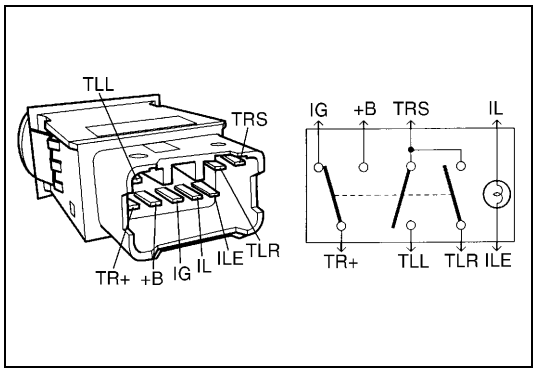


Connect turn signal and hazard relay (1), battery (3) and two test bulbs (12 V, 27 W) (2) as shown.
Unless a continued flash on and off is visible, replace.

Reference flashing cycle
: 60 - 120 cycle/minute

HAZARD SWITCH

INSPECTION



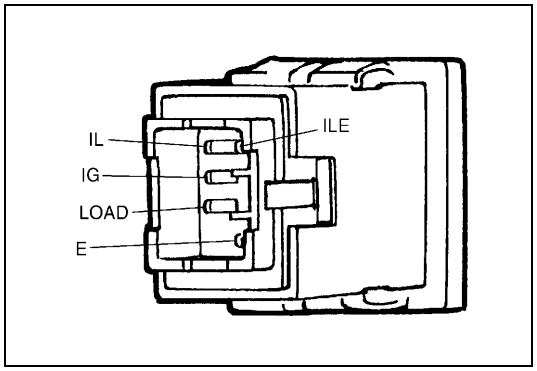
Check for continuity between terminals at each switch position as shown below. if check result is not as specified, replace.

Terminal / Hazard SW	+B	TR+	IG	TRS	TLL	TLR	IL	ILE
OFF		○—○					○—○—○	
ON	○—○			○—○—○			○—○—○	

FRONT FOG LIGHTS (IF EQUIPPED)

FRONT FOG LIGHT SWITCH

INSPECTION



Check for continuity between terminals at each switch position as shown below. if check result is not as specified, replace.

Switch Position / Terminal	IG	LOAD	E	IL	ILE
OFF		○—○—○		○—○—○	
ON	○	○—○—○		○—○—○	

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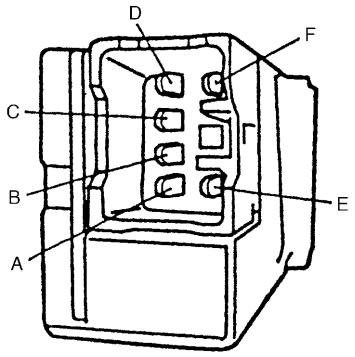
REAR FOG LIGHT (IF EQUIPPED)

REAR FOG LIGHT SWITCH

INSPECTION

Check for continuity between terminals. Hold the switch button (ON or OFF) pushed in during checking switch.



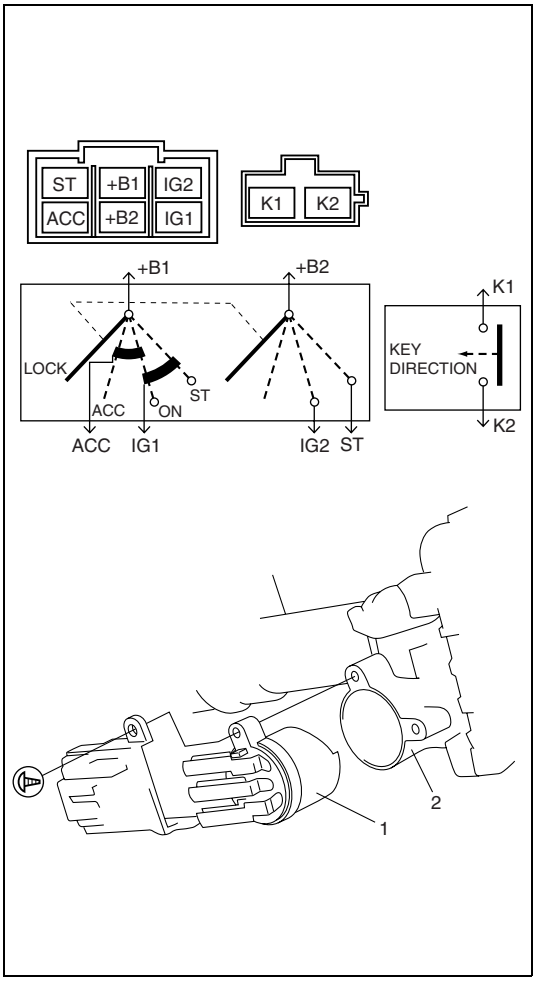
RR FOG SW \ TERMINAL / OFF SW		B	E	D	A	C	F
FREE	FREE		○	○	○	○	○
	PUSH		○	○	○	○	○
PUSH	FREE	○	○	○		○	○
	PUSH		○	○	○	○	○

NOTE:

Rear fog light lights up only when headlight (low or high beams) or front fog light switch (if equipped) is ON. Rear fog lights turns OFF automatically when headlight or front fog light switch is turned OFF.

IGNITION SWITCH

ON-VEHICLE INSPECTION



1) Disconnect negative cable at battery.
2) Remove steering column hole cover.
3) Remove steering column upper and lower cover.
4) Disconnect main harness couplers from ignition switch.
5) Check for continuity between terminals at each switch position as shown below. If check result is not as specified, replace.

Key \ Terminal / Position		+B1	+B2	+ACC	IG1	IG2	ST	K1	K2
OUT	LOCK	○							
IN		○						○	○
	ACC	○		○					
	ON	○	○	○	○				
	START	○	○		○		○		

REMOVAL

1) Disconnect negative cable at battery.
2) Remove steering column hole cover.
3) Remove steering column upper and lower cover.
4) Disconnect main harness couplers from ignition switch (1).
5) Remove ignition switch (1) from key cylinder (2).

INSTALLATION

Reverse removal procedure for installation.

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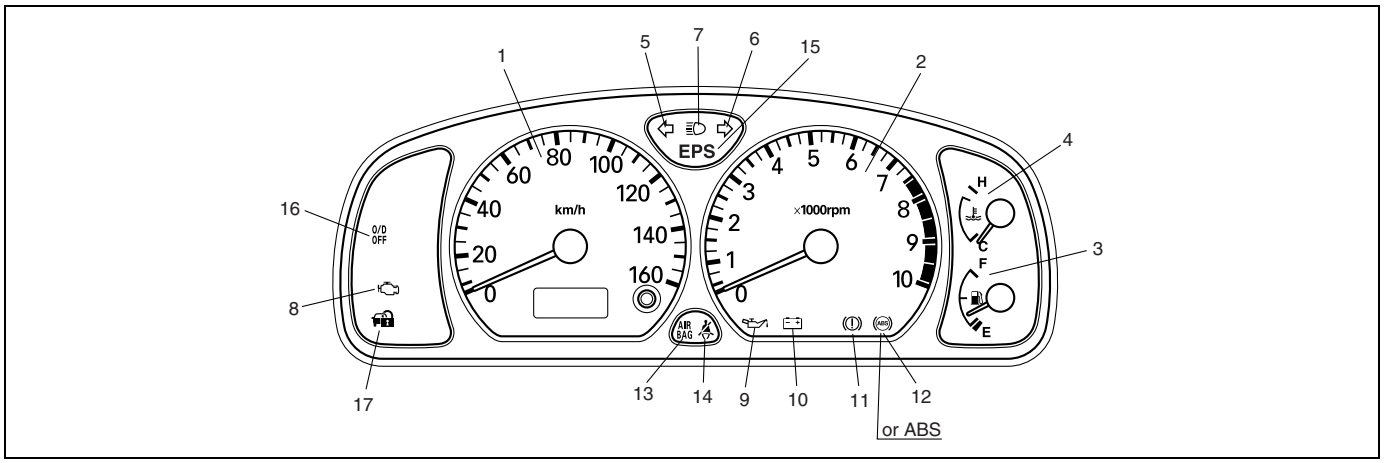
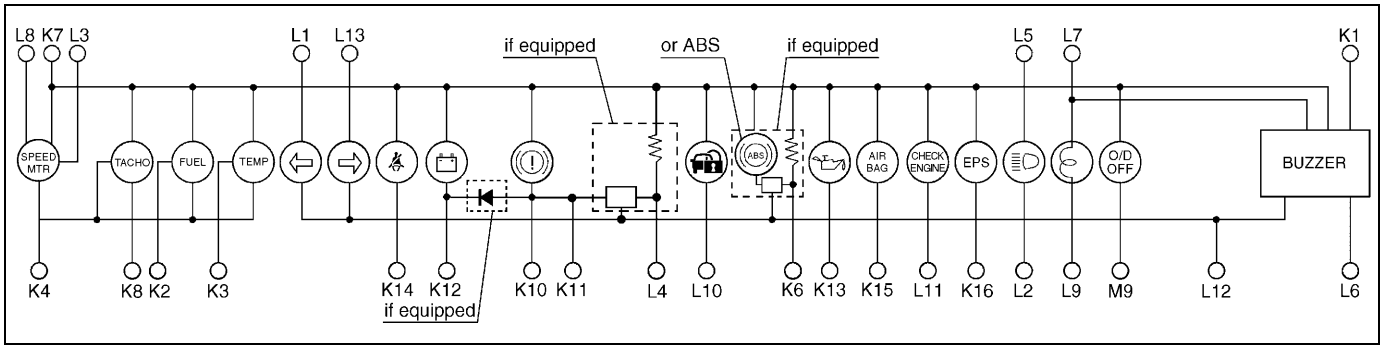
COMBINATION METER

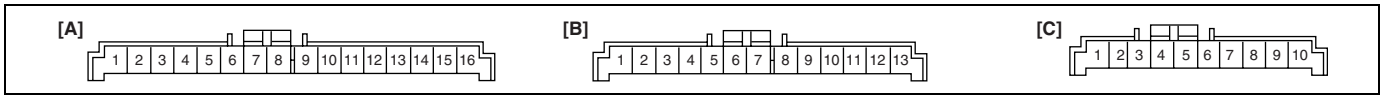
CIRCUIT



1. Speedometer	7. High beam light	13. "AIR BAG" warning light (if equipped)
2. Tachometer	8. Check engine light	14. Seat belt light (if equipped)
3. Fuel level meter	9. Oil pressure warning light	15. EPS warning light (if equipped)
4. Water temperature meter	10. Charge warning light	16. "O/D OFF" light (A/T vehicle only)
5. Turn signal pilot light (LH)	11. Brake warning light	17. Immobilizer warning light (if equipped)
6. Turn signal pilot light (RH)	12. ABS warning light (if equipped)	



Terminal arrangement of coupler viewed from harness side



[A] : Connector K		[B] : Connector L		[C] : Connector M	
1. To ignition switch	BLU/YEL	1. To combination switch (turn L)	GRN/RED	1. Blank	–
2. To fuel level gauge	YEL/RED	2. To combination switch (dimmer switch)	RED	2. Blank	–
3. To ECT sensor	YEL/GRN	3. To VSS	PPL	3. Blank	–
4. To ground	BLK/ORN	4. To ABS control module	PNK/BLU	4. Blank	–
5. Blank	–	5. To main fuse	WHT/BLU	5. Blank	–
6. To ABS control module	RED/BLU	6. To door switch (driver side)	BLK/YEL	6. Blank	–
7. To ignition switch	BLK/WHT	7. To combination switch (dimmer switch)	RED/YEL	7. Blank	–
8. To ECM (if equipped)	BRN	8. To main fuse	WHT/RED	8. Blank	–
9. Blank	–	9. To ground	BLK	9. To TCM (for A/T vehicle)	BLU
10. To brake fluid level switch	RED/BLK	10. To ECM (if equipped)	PNK	10. Blank	–
11. To parking brake switch	BLK/RED	11. To ECM	PPL/WHT		
12. To generator	WHT/BLU	12. To ground	BLK		
13. To oil pressure switch	YEL/BLK	13. To combination switch (turn R)	BLU/YEL		
14. To seat belt switch	BRN/YEL				
15. To SDM (if equipped)	YEL/BLK				
16. To EPS (if equipped)	YEL				

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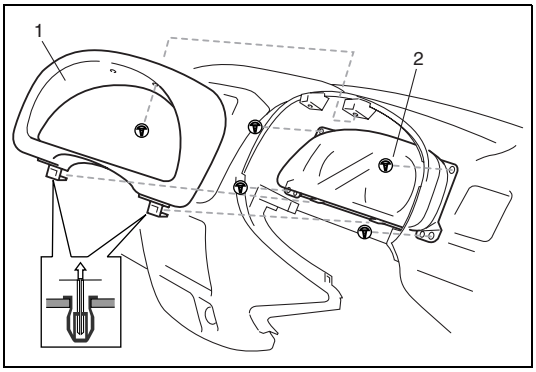


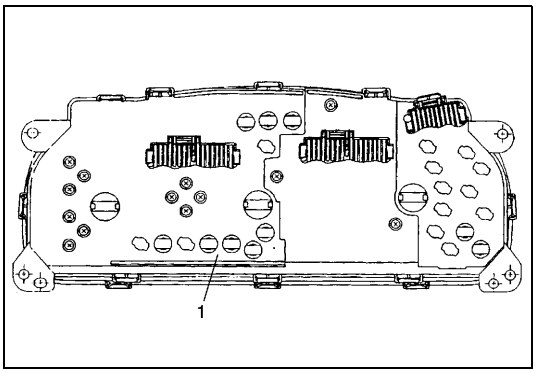
REMOVAL

1) Disconnect negative cable at battery.
2) Loosen steering column mounting nuts. Refer to Section 3C.
3) Remove meter cluster panel (1).
4) Disconnect all couplers from combination meter, then remove combination meter (2).

INSTALLATION

Reverse removal procedure for installation.

INSPECTION



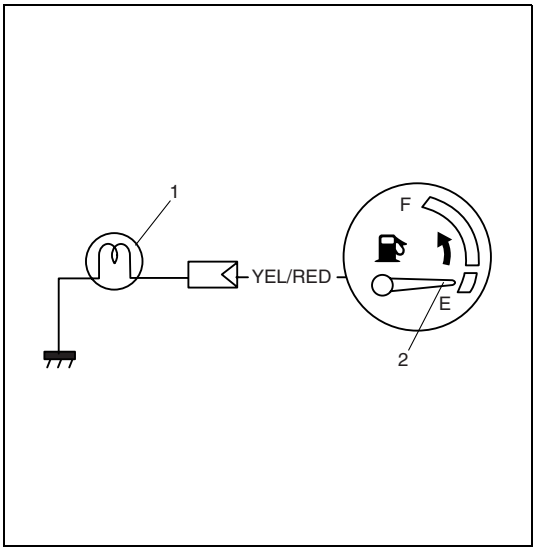
Check printed plate (1) visually for scratch, crack and discoloration.
If any of such faulty conditions is found, replace the printed plate (1).

FUEL METER AND FUEL LEVEL SENSOR (GAUGE UNIT)

FUEL LEVEL METER

INSPECTION

Operation check



1) Remove combination meter. Refer to “COMBINATION METER”.
2) Remove “YEL/RED” wire terminal from combination meter connector and reconnect combination connectors to combination meter.
3) Turn ignition switch ON, and check that pointer (2) of fuel meter indicates “E”.
4) Turn ignition switch OFF.
5) Short “YEL/RED” wire terminal to body ground through a 3.4 W bulb (1) as shown in figure.
6) Turn ignition switch ON, and check that bulb light up and pointer (2) of meter moves from “E” to “F”.
   If check result is not satisfied, replace.

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FUEL LEVEL SENSOR (GAUGE UNIT)

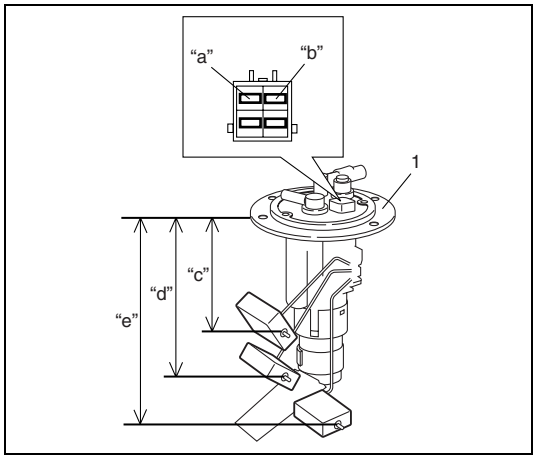
REMOVAL

Remove fuel pump assembly (1) referring to Section 6C.

INSTALLATION

Install fuel pump assembly (1) referring to Section 6C.

INSPECTION



- Check that resistance between terminals "a" and "b" of fuel level sensor changes with change of float position.
- Check resistance between terminals "a" and "b" in each float position below.
  If the measured value is out of specification, replace.

Fuel level sensor specification

Float Position		Resistance (Ω)
Full Upper "c"	59.6 mm (2.35 in.)	2 - 4
Middle (1/2) "d"	121.6 mm (4.79 in.)	29.5 - 35.5
Full Lower "e"	202.3 mm (7.96 in.)	119 - 121

SPEED METER AND VSS

VSS

REMOVAL AND INSTALLATION

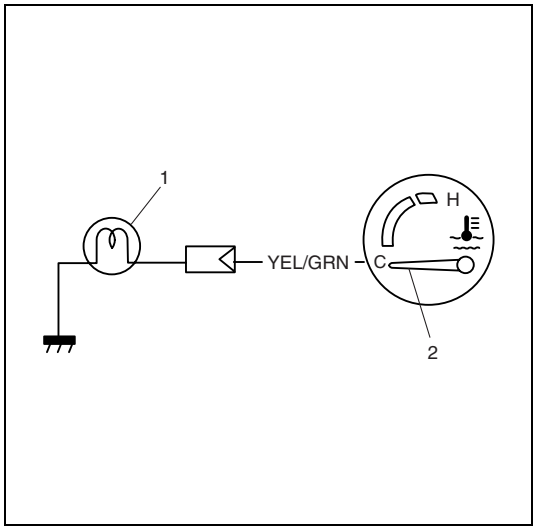
Refer to "VSS" in Section 6E1.

ENGINE COOLANT TEMPERATURE (ECT) METER AND SENSOR

ENGINE COOLANT TEMPERATURE (ECT) METER

INSPECTION

Operation check



1) Remove combination meter. Refer to "COMBINATION METER".
2) Remove "YEL/GRN" wire terminal from combination meter connector and reconnect combination connectors to combination meter.
3) Turn ignition switch ON, and check that pointer (2) of ECT meter indicates "C" as shown in figure.
4) Ignition switch OFF.
5) Short "YEL/GRN" wire terminal to body ground through a 3.4 W bulb (1) as shown in figure.
6) Turn ignition switch ON, and check that bulb light up and pointer (2) of meter moves from "C" to "H".
   If check result is not satisfied, replace.

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ECT SENSOR

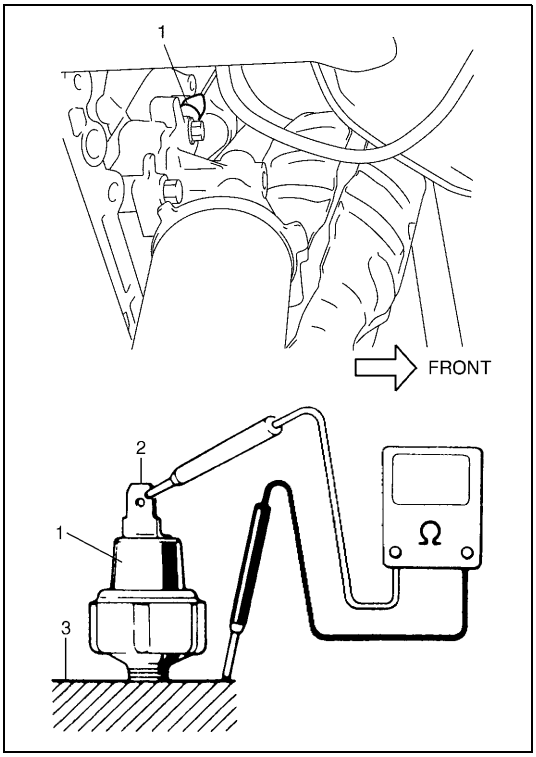
REMOVAL, INSTALLATION AND INSPECTION

Refer to “ECT SENSOR” in Section 6E1.

OIL PRESSURE WARNING LIGHT

OIL PRESSURE SWITCH

ON-VEHICLE INSPECTION



1) Disconnect oil pressure switch (1) lead wire.
2) Check for continuity between oil pressure switch terminal (2) and cylinder block (3) as shown in figure.
   If not, replace oil pressure switch (1).

Oil pressure switch specification
During engine running : No continuity
At engine stop : Continuity

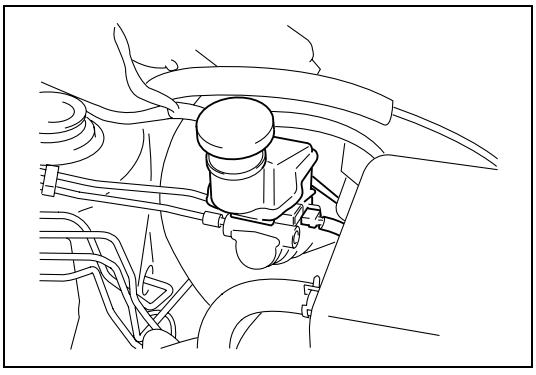
REMOVAL AND INSTALLATION

Refer to “OIL PRESSURE CHECK” in Section 6A1.

BRAKE FLUID LEVEL AND PARKING BRAKE WARNING LIGHT

BRAKE FLUID LEVEL SWITCH

INSPECTION



Check for continuity between terminals of brake fluid level switch coupler.
If found defective, replace switch.

Brake fluid level switch specification
OFF position (float up) : No continuity
ON position (float down) : Continuity

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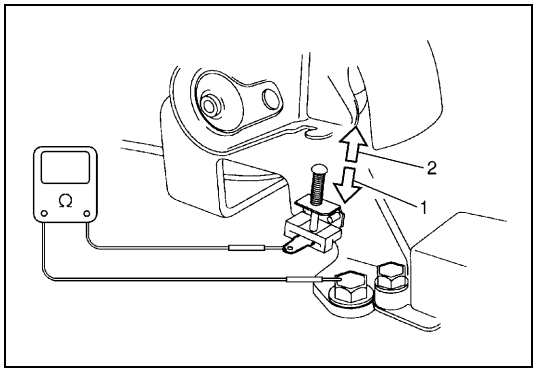
PARKING BRAKE SWITCH

INSPECTION



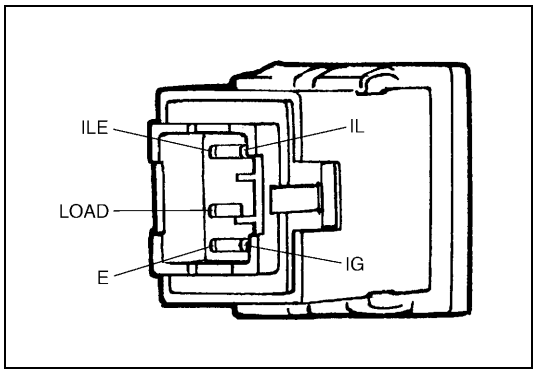
Check for continuity between parking brake switch terminal and body ground as shown in figure.
If found defective, replace switch.

Parking brake switch specification
OFF position (parking brake released) (1) :
No continuity
ON position (parking brake lever pulled up) (2) :
Continuity

REAR WINDOW DEFOGGER

DEFOGGER SWITCH

INSPECTION

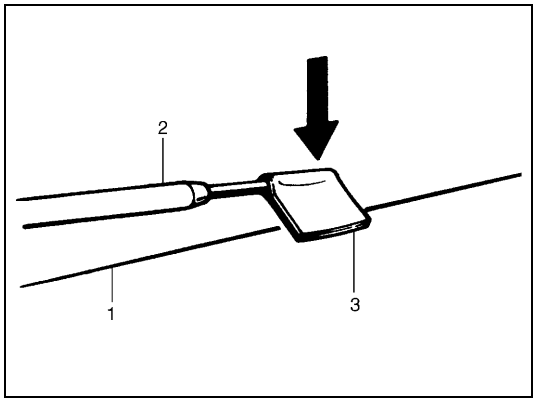


Check for continuity between terminals at each switch position as shown below. If check result is not satisfied, replace.

Terminal / SwitchPosition	IG	LOAD	E	IL	ILE
OFF		○ ◎	○	○ ◎ ○	
ON (PUSH IN)	○	○ ◎	○		

DEFOGGER WIRE

INSPECTION



NOTE:

- **When cleaning rear window glass, use a dry cloth to wipe it along heat wire (1) direction.**
- **When cleaning glass, do not use detergent or abrasive-containing glass cleaner.**
- **When measuring wire voltage, use a tester with negative probe (2) wrapped with a tin foil (3) which should be held down on wire by finger pressure.**

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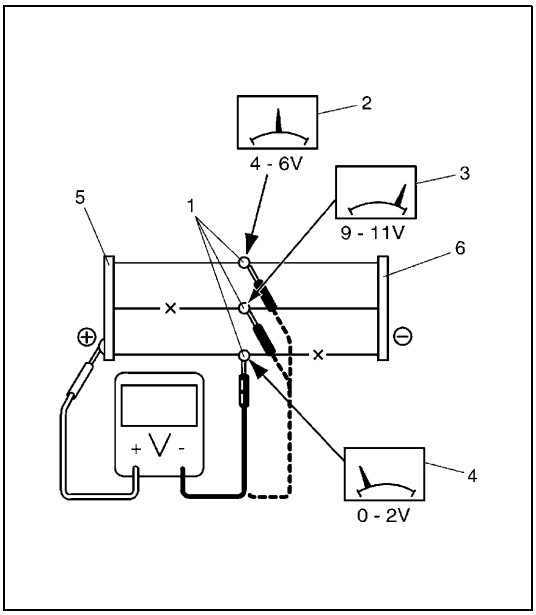
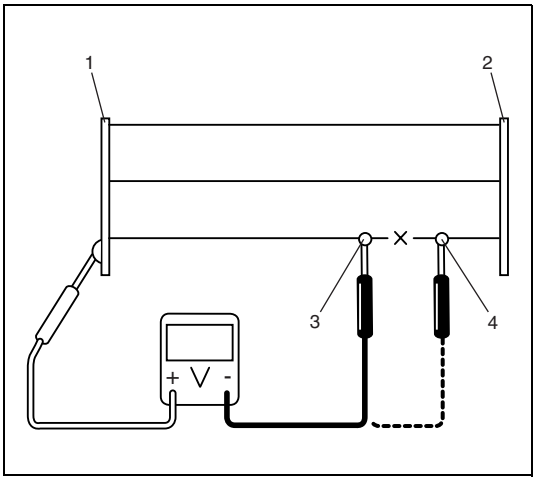


- Wire damage inspection.

a) Turn ignition switch ON.
b) Turn defogger switch ON.
c) Check voltage at the center (1) of each heat wire as shown below.
   If measured voltage is 10 V, wire must be damaged between its center and positive end (5).
   If voltage is 0 V, wire must be damaged between its center and ground end (6).

Voltage	Criteria
Approx. 4 - 6 V (2)	Good (No break in wire)
Approx. 9 - 11 V (3) or 0 - 2 V (4)	Broken wire

X : Damage point

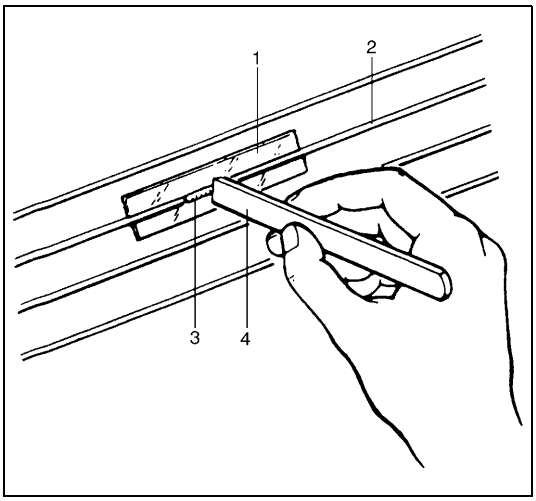


- Damage point locating.

a) Turn ignition switch ON.
b) Turn defogger switch ON.
c) Touch voltmeter positive (+) lead to heat wire positive terminal end (1).
d) Touch voltmeter negative (-) lead with a foil strip to heat wire positive terminal end (1), then move it along wire to the negative terminal end (2).
e) The place where voltmeter fluctuates from 0 - 2 V (3) to several volts (4) is where there is damage.

X : Damage point

REPAIR



1) Use white gasoline for cleaning.
2) Apply masking tape (1) at both upper and lower sides of heat wire (2) to be repaired.
3) Apply commercially-available repair agent (3) with a fine-tip brush (4).
4) 2 to 3 minutes later, remove masking tapes (1).
5) Leave repaired heat wire as it is for at least 24 hours before operating rear defogger again.

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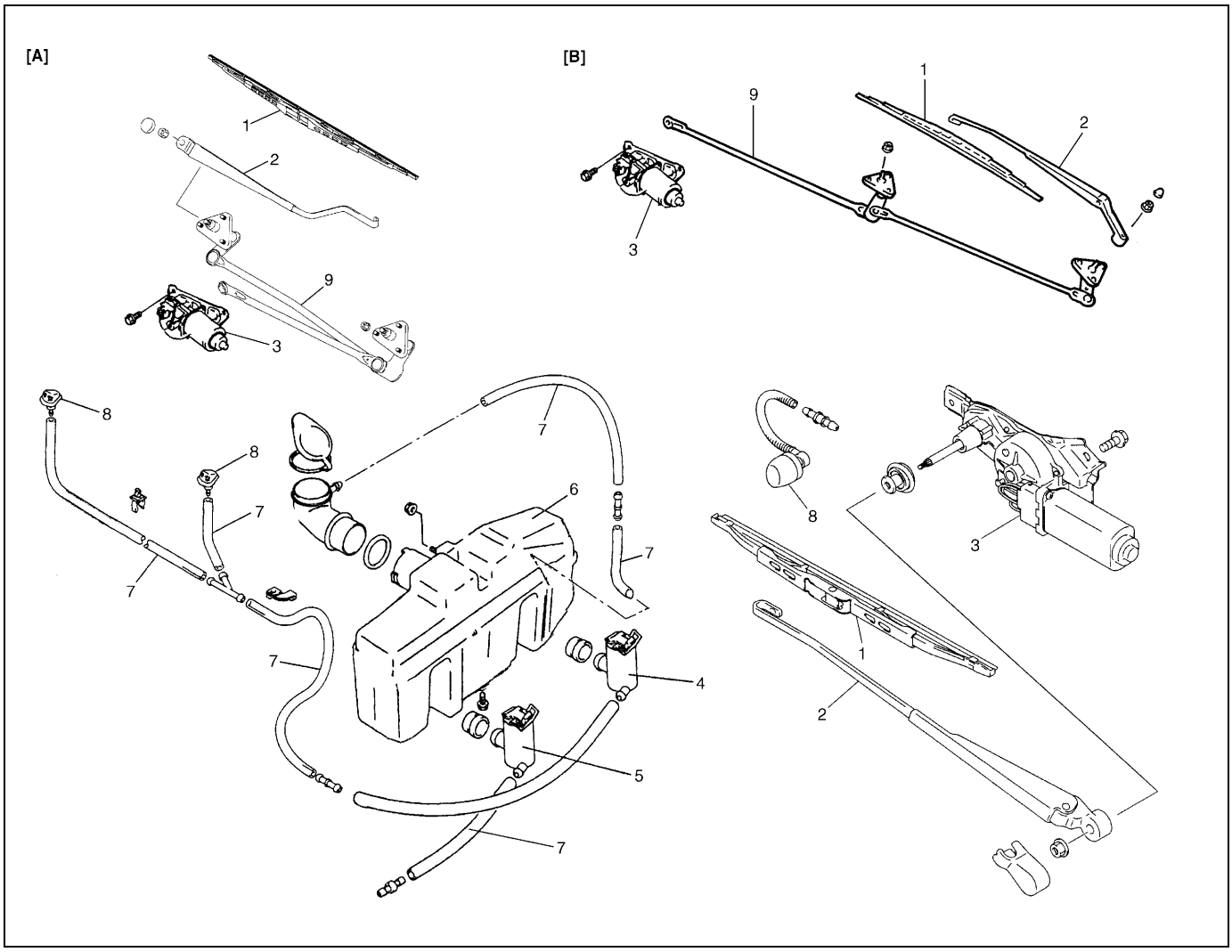
WIPERS AND WASHERS

COMPONENTS



[A] : RH steering vehicle	3. Wiper motor	7. Washer hose
[B] : LH steering vehicle	4. Washer pump (for front washer)	8. Washer nozzle
1. Wiper blade	5. Washer pump (for rear washer)	9. Wiper link
2. Wiper arm	6. Washer tank	

FRONT WIPER AND WASHER SWITCH

REMOVAL AND INSTALLATION

Refer to “CONTACT COIL AND COMBINATION SWITCH ASSEMBLY” in Section 3C.

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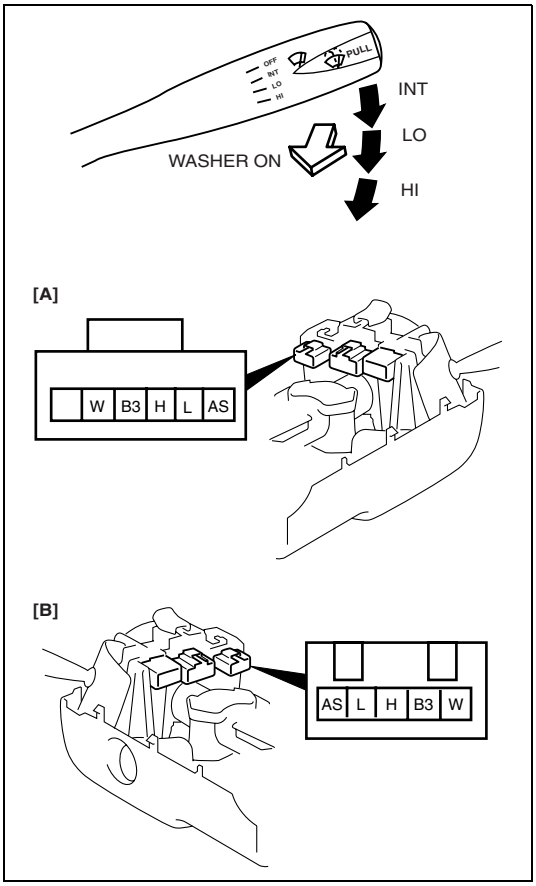
INSPECTION



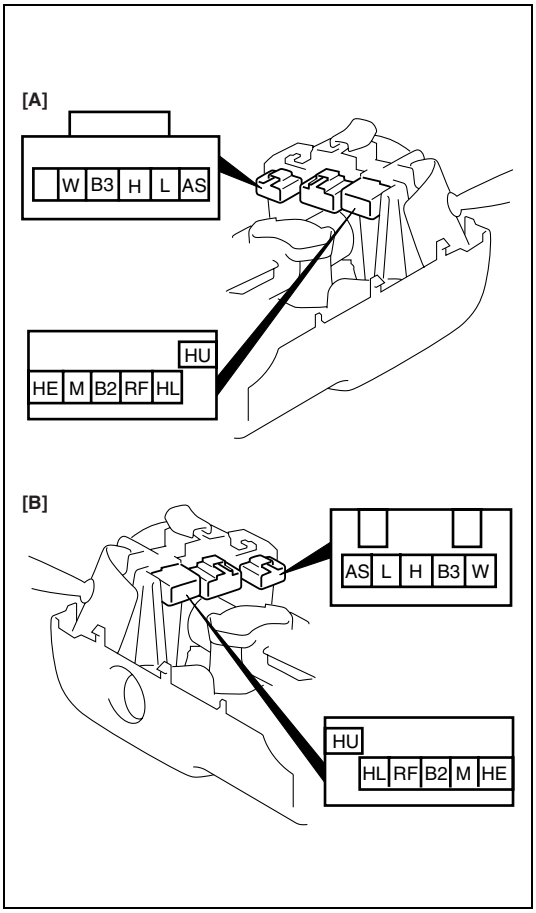
Check for continuity between terminals at each switch position as shown below.
If check result is not as specified, replace.

Wiper SW \ Terminal	B3	H	L	AS
OFF			○——	——○
INT			○——	——○
LO	○——		——○	
HI	○——	——○		

Washer SW \ Terminal	B3	W
OFF		
ON	○——	——○

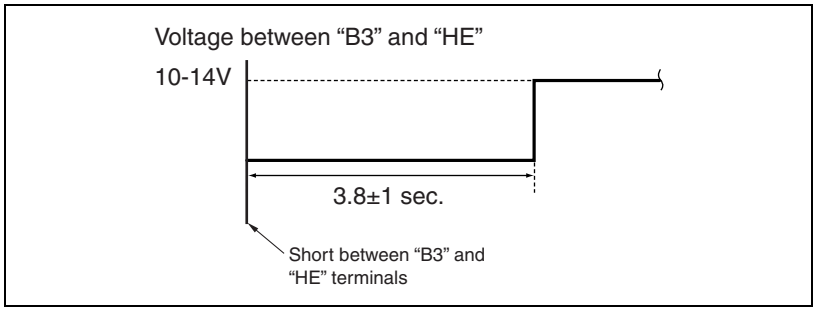
[A] : LH steering vehicle
[B] : RH steering vehicle

INTERMITTENT WIPER RELAY CIRCUIT INSPECTION



1) Turn the front wiper switch to “INT” position.
2) Connect battery positive terminal to terminal “B3” and its negative terminal to terminal “HE”
3) Connect voltmeter positive lead to terminal “H” and its negative lead to terminal “HE”.
4) Check that the voltmeter indicates the battery voltage (10 - 14 V).
5) Connect terminal “AS” and terminal “B3” by a jumper wire.
6) When “B3” and “HE” are shorted by other jumper wire, check that voltage changes as shown in figure.
   If check result is not satisfied, replace.

[A] : LH steering vehicle
[B] : RH steering vehicle



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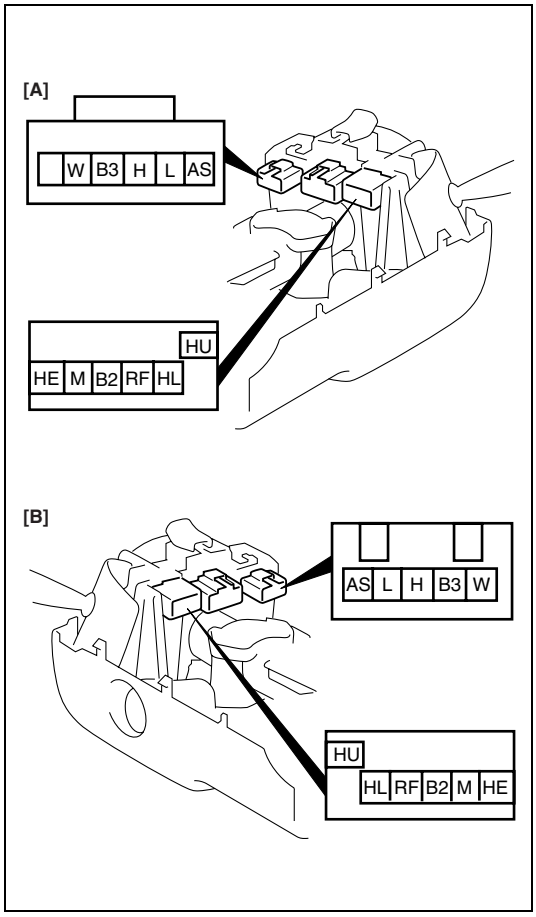
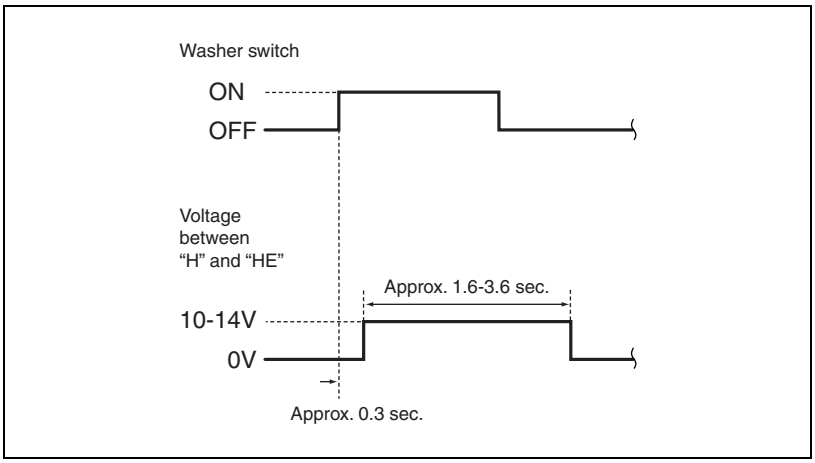
WASHER LINKED CIRCUIT INSPECTION



1) Make sure that front wiper switch is at “OFF” position.
2) Connect battery positive terminal to terminal “B3” and its negative terminal to terminal “HE”.
3) Connect voltmeter positive lead to terminal “H” and its negative lead to terminal “HE”.
4) When front washer switch is ON (pushed to forward), check that voltage changes as shown in figure.

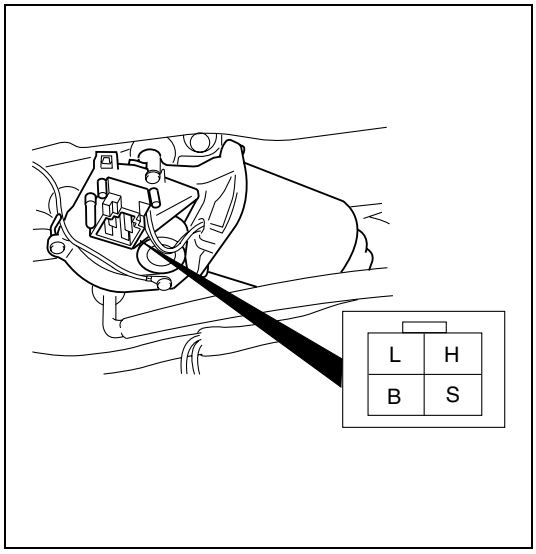
[A] : LH steering vehicle
[B] : RH steering vehicle



FRONT WIPER MOTOR

INSPECTION

Motor Operation (Low Speed)



1) Connect battery positive terminal to terminal “L” and its negative terminal to motor bracket (wiper ground).
2) Check motor revolution speed as specification.

Front wiper motor specification (at low speed)
: 44 - 52 r/min (rpm)

Motor Operation (High Speed)

1) Connect battery positive terminal to “H” and its negative terminal to motor bracket (wiper ground).
2) Check motor revolution speed as specification.

Front wiper motor specification (at high speed)
: 64 - 78 r/min (rpm)

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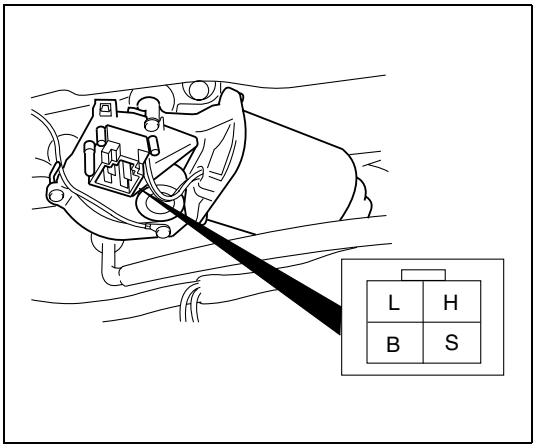
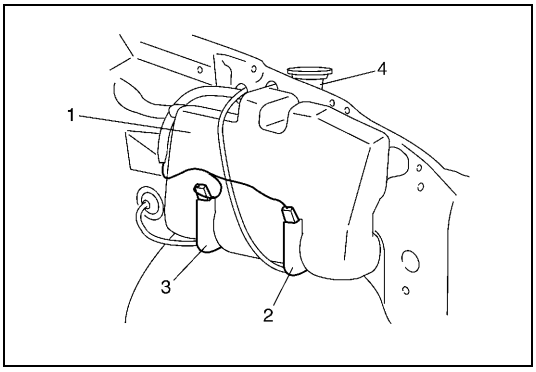


Automatic Stop Operation

1) Connect battery positive terminal to terminal “L” and its negative terminal to motor bracket (wiper ground) and let the motor turn.
2) Disconnect terminal “L” from battery positive terminal, and let the motor stop.
3) Connect terminal “L” and “S” with a jumper wire, and connect terminal “B” to battery positive terminal. Observe the motor turns once again then stops at a specified position.
4) Repeat Step 1) to 3) several times and check that the motor stops at the specified position every time.
   If check result is not satisfied, replace.

WASHER TANK AND WASHER PUMP

REMOVAL

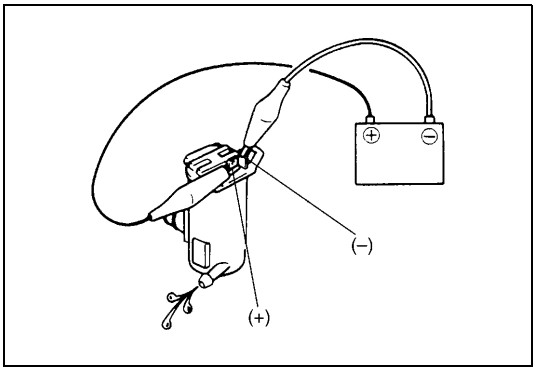


1) Disconnect negative cable at battery.
2) Remove front fender lining (RH).
3) Remove washer tank attaching nuts and inlet pipe (4).
4) Disconnect pump lead wire coupler(s) and hoses.
5) Remove washer tank (1).
6) Remove front washer pump (2) and rear washer pump (3) (if equipped) from washer tank (1).

INSTALLATION

Reverse removal procedure for installation.

INSPECTION



1) Connect battery (+) and (-) terminals to pump (+) and (-) terminals respectively.
2) Check motor operation for both front and rear (if equipped) washer pump.

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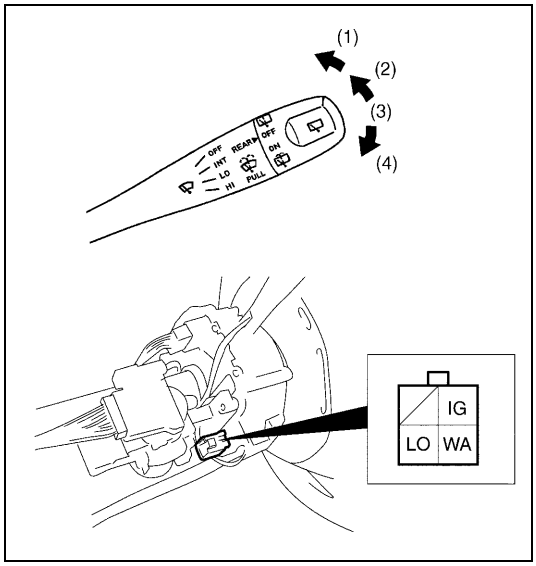
REAR WIPER AND WASHER SWITCH (IF EQUIPPED)

INSPECTION

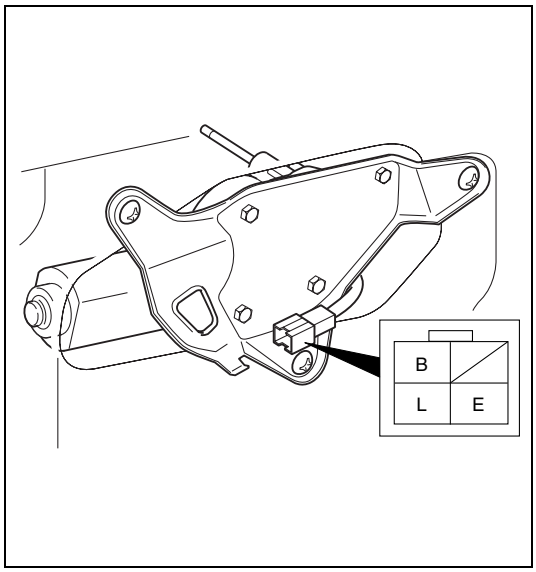


Check for continuity between terminals at each switch position as shown below.
If check result is not as specified, replace.

Position \ Terminal	IG	LO	WA
(1) WIPER and WASHER ON	○	○	○
(2) WIPER ON	○	○	
(3) OFF			
(4) WASHER and WASHER ON	○	○	○

REAR WIPER MOTOR

INSPECTION



Wiper Motor

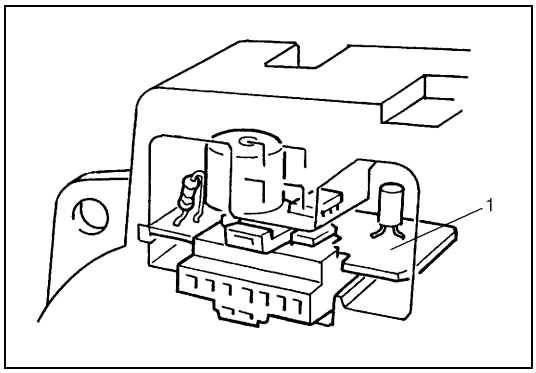
Use a 12 V battery to connect its (+) and (-) terminals to terminal “L” and terminal “E” respectively. Then motor should rotate at 35 to 45 rpm.

Automatic Stop Operation

1) Connect battery positive terminal to terminal “L” and its negative terminal to terminal “E” and let the motor turn.
2) Disconnect terminal “L” from battery positive terminal and let the motor stop.
3) Connect terminal “B” to battery positive terminal. Observe the motor turns once again then stops at a specified position.
4) Repeat Step 1) to 3) several times, and check that the motor stops at the specified position every time.

IGNITION KEY REMAINDER (IF EQUIPPED) AND LIGHT REMAINDER WARNING BUZZER

REMOVAL



1) Remove combination meter. Refer to “COMBINATION METER”.
2) Remove buzzer unit (1) from combination meter.

INSTALLATION

Reverse removal procedure for installation.

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POWER WINDOW CONTROL SYSTEM (IF EQUIPPED)

POWER WINDOW MAIN SWITCH

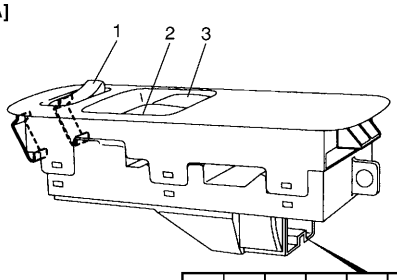
INSPECTION

Check for continuity between terminals at each switch position as shown below. If check result is not as specified, replace.

Window Lock Switch (1)		Driver Side Window Switch (2)				Passeger Side Window Switch (3)				Rear RH Window Switch (4)				Rear LH Window Switch (5)			
	TYPE 1	B	E	FLU	FLD	B	E	FRU	FRD	—	—	—	—	—	—	—	—
	TYPE 2			FRU	FRD			FLU	FLD								
	TYPE 3			FLU	FLD			FRU	FRD	B	E	RRU	RRD	B	E	RLU	RLD
	TYPE 4			DU	DD			PU	PD	—	—	—	—	—	—	—	—
OFF	UP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	OFF		○	○	○		○	○	○		○	○	○		○	○	○
	DOWN	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ON	UP	○	○	○	○	○	○	○		○	○	○		○	○	○	
	OFF		○	○	○			○	○			○	○			○	○
	DOWN	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

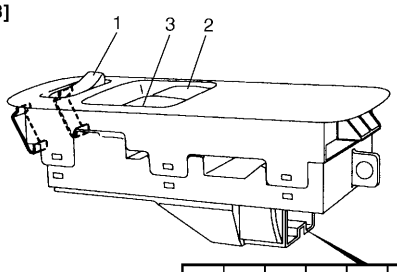
[A] : TYPE 1 (LH steering vehicle)
[B] : TYPE 2 (RH steering vehicle)
[C] : TYPE 3
[D] : TYPE 4

[A]



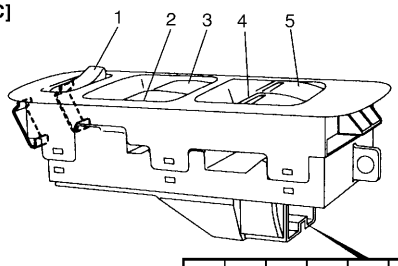
		E	B		
FLU	FLD			FRU	FRD

[B]



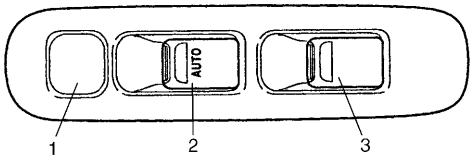
		E	B		
FLU	FLD			FRU	FRD

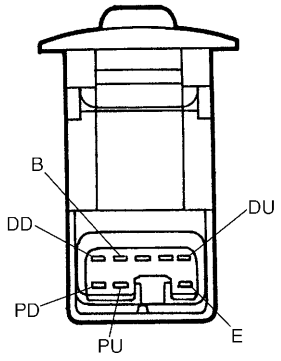
[C]



RLU	RLD	E	B	RRU	RRD
FLU	FLD			FRU	FRD

[D]





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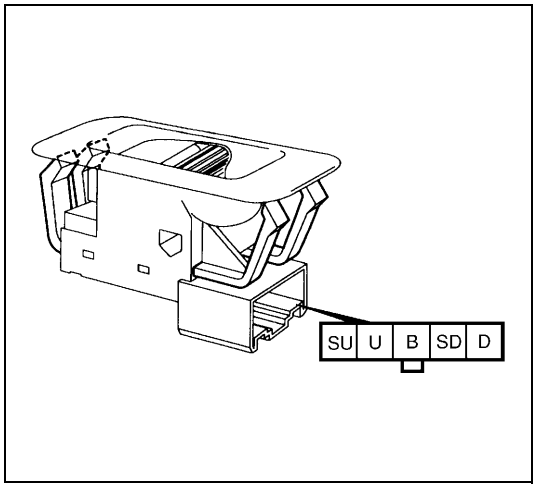
POWER WINDOW SUB SWITCH

INSPECTION

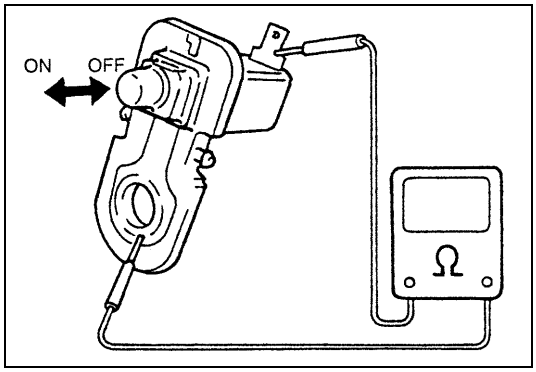


Check for continuity between terminals at each switch condition as shown below.
If check result is not as specified, replace.

Switch Position \ Terminal	B	SD	SU	D	U
UP	○	○		○	○
OFF		○	○	○	○
DOWN	○		○	○	○

DOOR SWITCH

INSPECTION



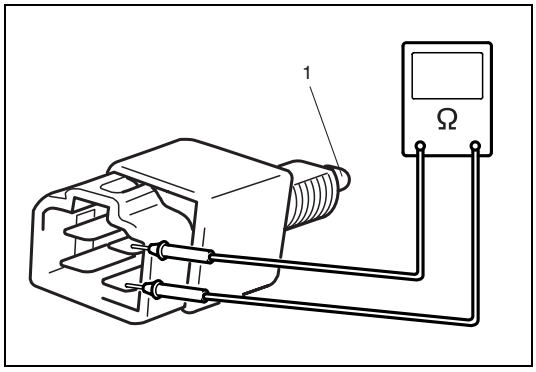
Remove door switch from body and check switch for continuity.
If found detective, replace switch.

Door switch specification

OFF position (Door closed)	No continuity
ON position (Door open)	Continuity

STOP LAMP (BRAKE) SWITCH

INSPECTION



Check stop lamp (brake) switch for continuity as shown in figure.
If found detective, replace switch.

Stop lamp (brake) switch specification
Switch slider (1) pushed ON : No continuity
Switch slider (1) released OFF : Continuity

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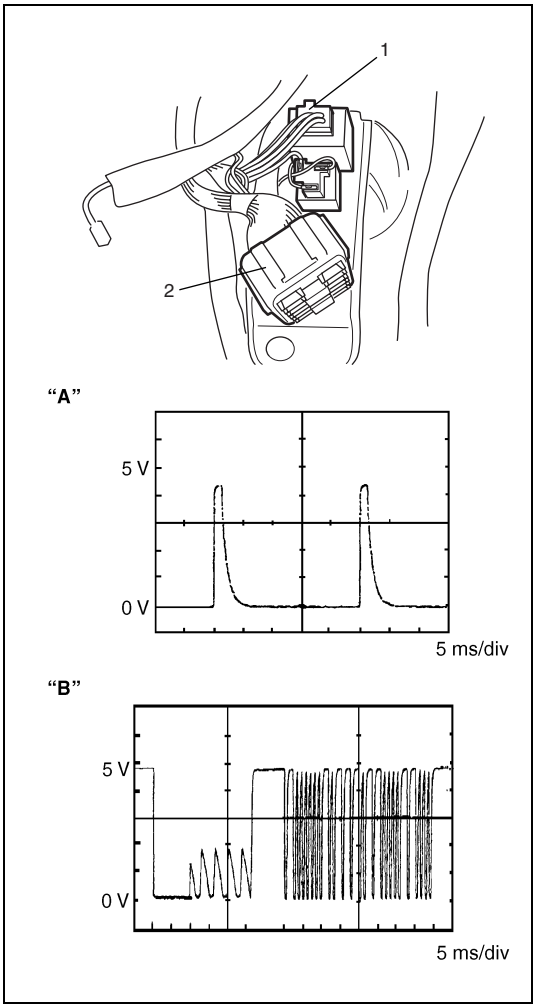
POWER DOOR LOCK SYSTEM (IF EQUIPPED)

DOOR LOCK CONTROLLER

INSPECTION



Check voltage between each terminal and body ground with connecting controller coupler.
If check result is not as specified, replace.

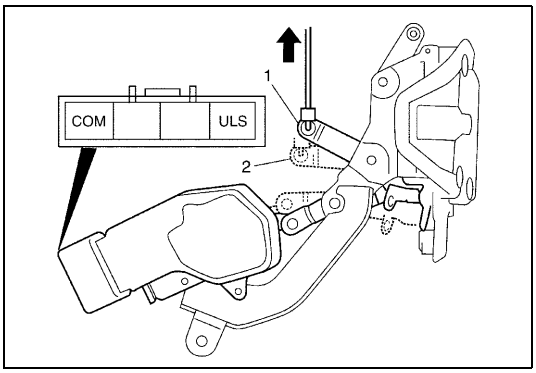
Door lock controller specification

Terminal	Voltage (V)	Condition
B	10 - 14	–
L	10 - 14	"LOCK" position
	0 - 1	Other position than "LOCK"
UL	10 - 14	"UNLOCK" position
	0 - 1	Other position than "UNLOCK"
ULS	0 - 1	"UNLOCK" position
	"A" (Refer to the figure.)	"LOCK" position
KL	"B" (Refer to the figure.)	Approx. 75 ms while "LOCK" position or "UNLOCK" position signal received
	5	Other condition than above mentioned
E	0	Always

1. Door lock controller
2. Fuse box

DRIVER'S DOOR KNOB SWITCH

ON-VEHICLE INSPECTION



1) Remove driver's door trim and disconnect door lock switch coupler.
2) Check for continuity between "ULS" terminal and "COM" terminal at each switch condition.

Driver's door knob switch specification
UNLOCK position (1) : Continuity
LOCK position (2) : No continuity

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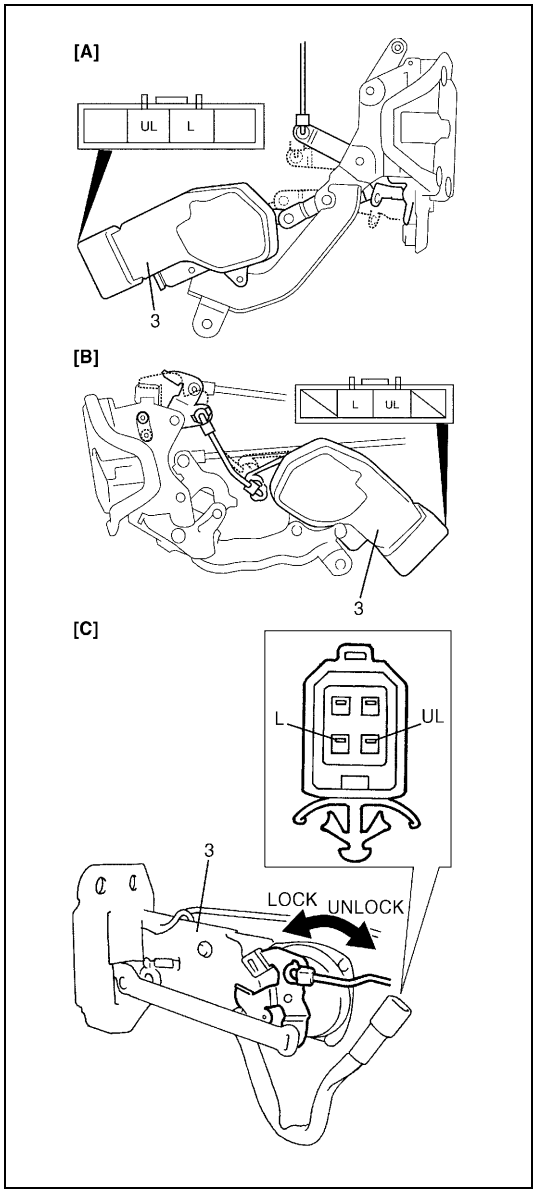
DOOR LOCK ACTUATOR

ON-VEHICLE INSPECTION



1) Remove door trim (front, rear or back) and disconnect door lock actuator (3) coupler.
2) Connect battery (+) terminal to terminal “L” and (-) terminal to terminal “UL”. Check that door lock actuator (3) is on “LOCK” position.
   If check result is not satisfied, replace.
3) Connect battery (+) terminal to terminal “UL” and (-) terminal to terminal “L”. Check that door lock actuator (3) is on “UNLOCK” position.
   If check result is not satisfied, replace.

[A] : FRONT DOOR
[B] : REAR DOOR
[C] : BACK DOOR

KEYLESS ENTRY SYSTEM (IF EQUIPPED)

DOOR LOCK CONTROLLER

INSPECTION

Refer to DOOR LOCK CONTROLLER of POWER DOOR LOCK SYSTEM (IF EQUIPPED) in this section.

DOOR LOCK ACTUATOR

INSPECTION

Refer to DOOR LOCK ACTUATOR of POWER DOOR LOCK SYSTEM (IF EQUIPPED) in this section.

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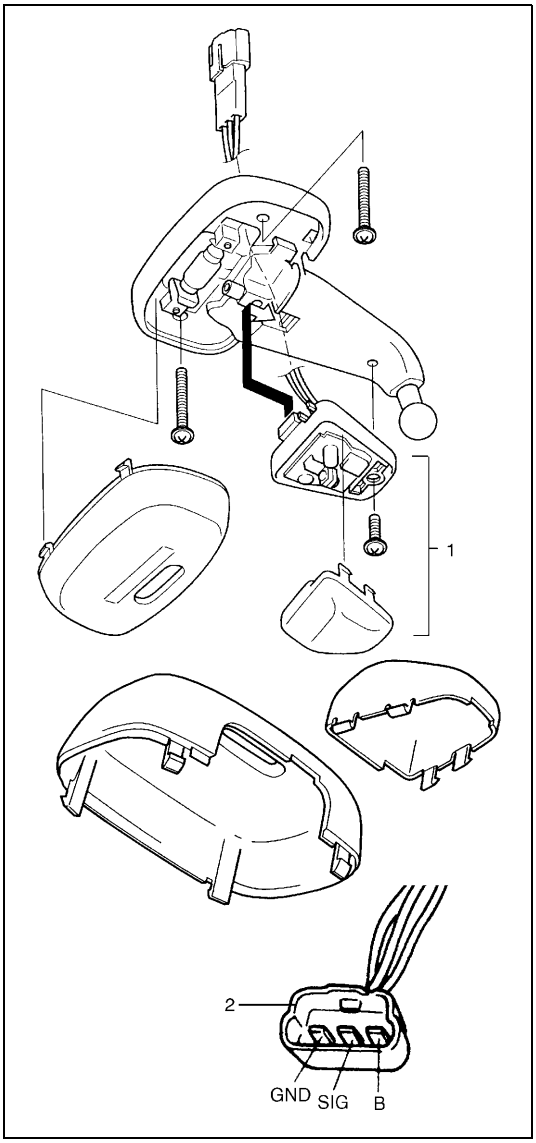
RECEIVER

INSPECTION

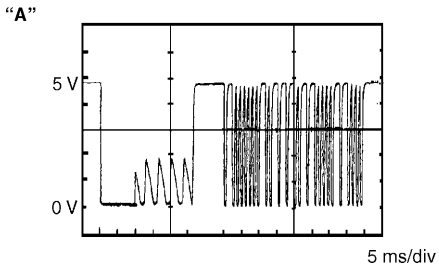


Check voltage between each terminal and body ground with connecting controller coupler. If check result is not as specified, replace.

Receiver specification

Terminal	Voltage (V)	Condition
B	10 - 14	Always
SIG	"A" (Refer to the figure)	Approx. 75 ms while transmitter signal received
	5	Other condition than above mentioned
GND	0	Always

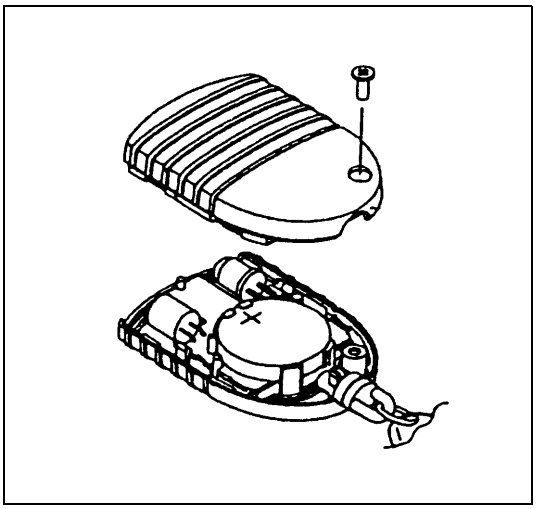
Reference :



1. Receiver
2. Receiver coupler (receiver side)

TRANSMITTER

REPLACEMEMT OF THE BATTERY



If the transmitter becomes unreliable, replace the battery.
As the battery power is consumed, the operation distance will be shorter.

1) Remove screw.
2) Use a small coin or flat blade screwdriver to separate the bottom half from the top half of the transmitter.
3) Replace the battery with the new one. Make sure the positive (+) side of battery faces up. For battery replacement, use type CR2032 or equivalent.
4) Put the two halves back together and install a screw.
5) Make sure the door locks can be operated with the transmitter.

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CAUTION:
Use care not to allow grease or dirt to be attached on the printed circuit board and the battery.

NOTE:

- **To prevent theft, be sure to break the transmitter before discarding it.**
- **Dispose of the used battery properly according to applicable rules or regulations. Do not dispose of lithium batteries with ordinary household trash.**

CODE REGISTRATION PROCEDURE

1) Confirm that IG switch is OFF position.
2) Remove DOOR LOCK fuse and install it again.
3) Press the button on the transmitter one time toward the receiver within 30 seconds.
4) If two transmitters are registered, repeat step 1) to 3) with other transmitter.

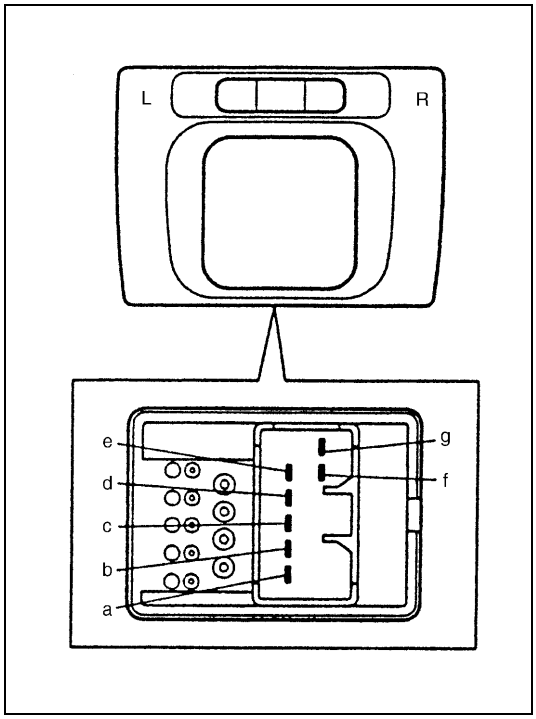
NOTE:

- **Two transmitter codes can be registered.**
- **When a new transmitter is registered, the oldest one will be cleared.**

POWER DOOR MIRROR CONTROL SYSTEM (IF EQUIPPED)

MIRROR SWITCH

INSPECTION



1) Remove mirror switch from instrument panel.
2) Check for continuity between terminals at each switch position as show below.
   If check result is not as specified, replace mirror switch.

L / R	a	b	c	d / e	g / f
UP	○	○	○		○
DOWN	○	○	○		○
LEFT	○	○	○	○	
RIGHT	○	○	○	○	

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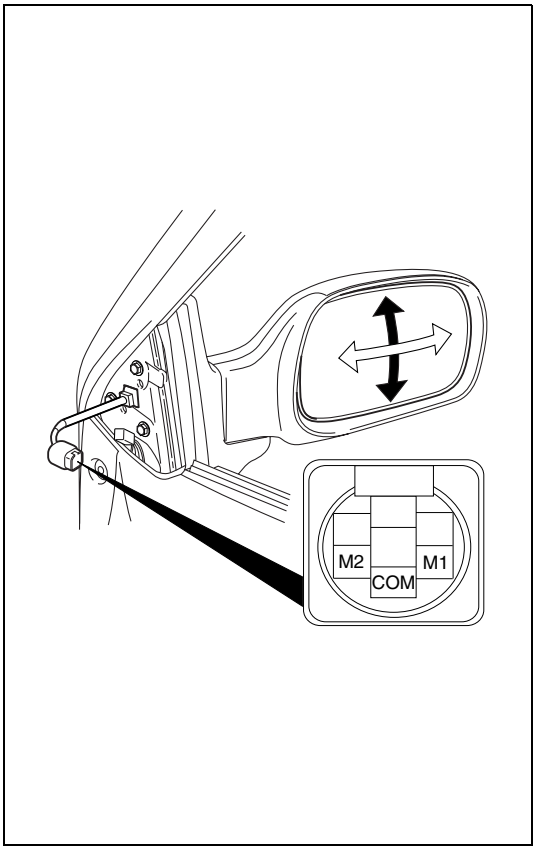
DOOR MIRROR ACTUATOR

INSPECTION



1) Remove garnish from door.
2) Pull out door mirror coupler at bracket.
3) Disconnect door mirror coupler.
4) Check that door mirror operates properly when battery voltage is applied to connector terminals.
   Connect battery positive and negative terminal to the door mirror terminal shown below.
   If it does not follow the table's operation, replace door mirror assembly.

Terminal / Operation	COM	M1	M2
Up	⊖	⊕	
Down	⊕	⊖	
Left	⊖		⊕
Right	⊕		⊖

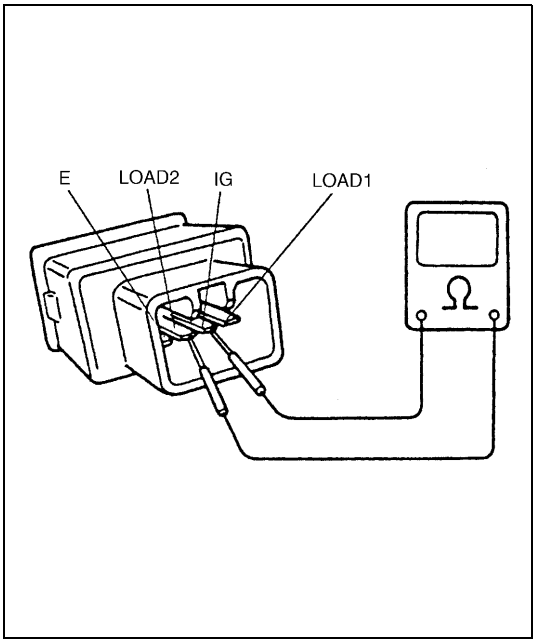
NOTE:

When installing door mirror to door, be careful not to pinch harness between door and door mirror.

FRONT SEAT HEATER (IF EQUIPPED)

SEAT HEATER SWITCH (DRIVER AND PASSENGER SIDE)

INSPECTION



1) Confirm that ignition switch is OFF position.
2) Pull out seat heater switch from front center console box.
3) Disconnect seat heater switch coupler.
4) Check for continuity between terminals at each switch position as show below. If check result is not as specified, replace.

Terminal / Switch Position	IG	LOAD1	LOAD2	E
OFF				
LO	○ ○	○ ○	○	○
HI	○ ○	○ ○	○	○ ○

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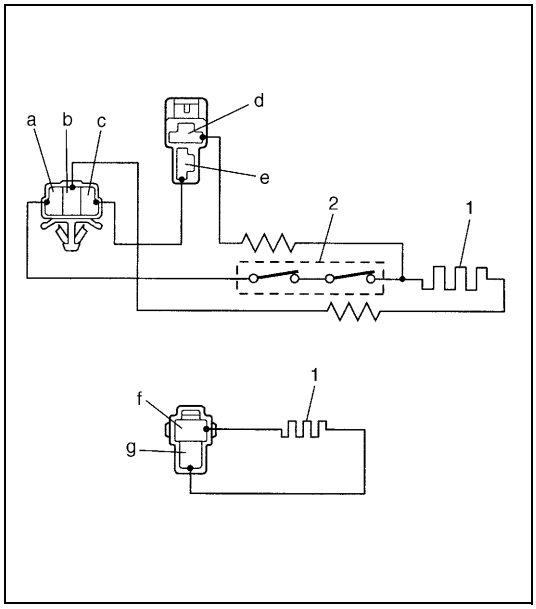
SEAT HEATER WIRE

INSPECTION



1) Confirm that seat heater switch is OFF position.
2) Disconnect two couplers of seat heater under the seat cushion.
3) Check for continuity between terminals as show below.
   If not continuity, replace faulty seat heater.

Seat heater circuit in seat back
Between “a” and “b”
Between “b” and “d”
Between “c” and “e”

Seat heater circuit in seat cushion
Between “f” and “g”

1. Heater wire
2. Thermostat

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SECTION 8G

IMMOBILIZER CONTROL SYSTEM

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

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GENERAL DESCRIPTION

The immobilizer control system designed to prevent vehicle burglar consists of following components.

- Engine control module (ECM)
- Immobilizer control module (1) with coil antenna
- Ignition key (2) with built-in transponder

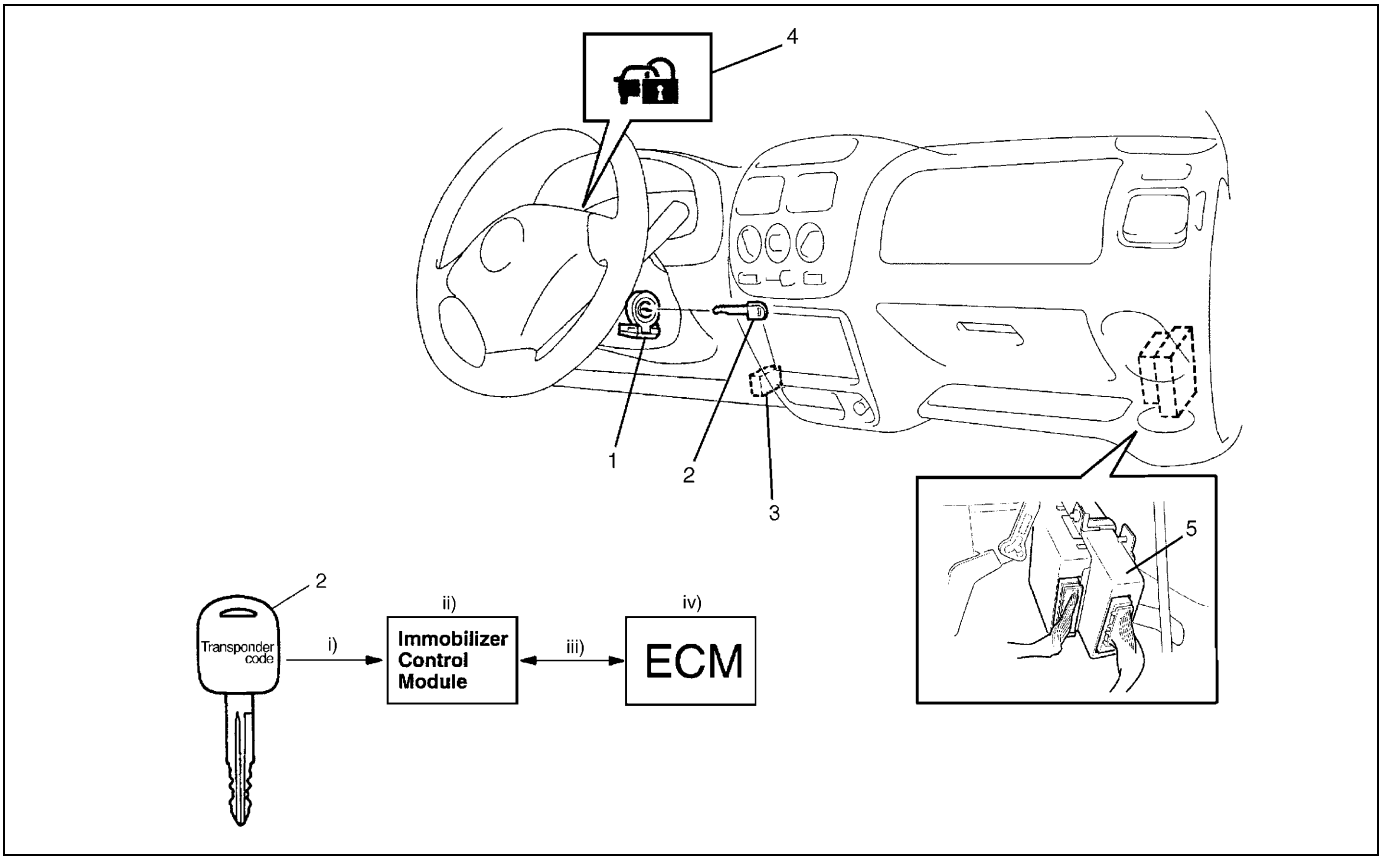
Operation of this system is as follows.

i) Each ignition key has its own code (Transponder code) stored in memory. When the ignition switch is turned ON, Immobilizer Control Module tries to read the Transponder code through the coil antenna installed to the steering lock assembly.

ii) Immobilizer Control Module compares the Transponder code read in Step (i) and that registered in Immobilizer Control Module and checks if they match.

iii) When it is confirmed that two Transponder codes match each other as described above, Immobilizer Control Module and ECM check if ECM/Immobilizer Control Module codes registered in them respectively match.

iv) Only when it is confirmed that ECM/Immobilizer Control Module codes match, the engine starts running. If Transponder codes in Step (ii) or ECM/Immobilizer Control Module codes in Step (iii) do not match, ECM will stop operation of the injector and ignition of spark plug.



3.	Data link connector (DLC)
4.	Immobilizer indicator lamp
5.	ECM

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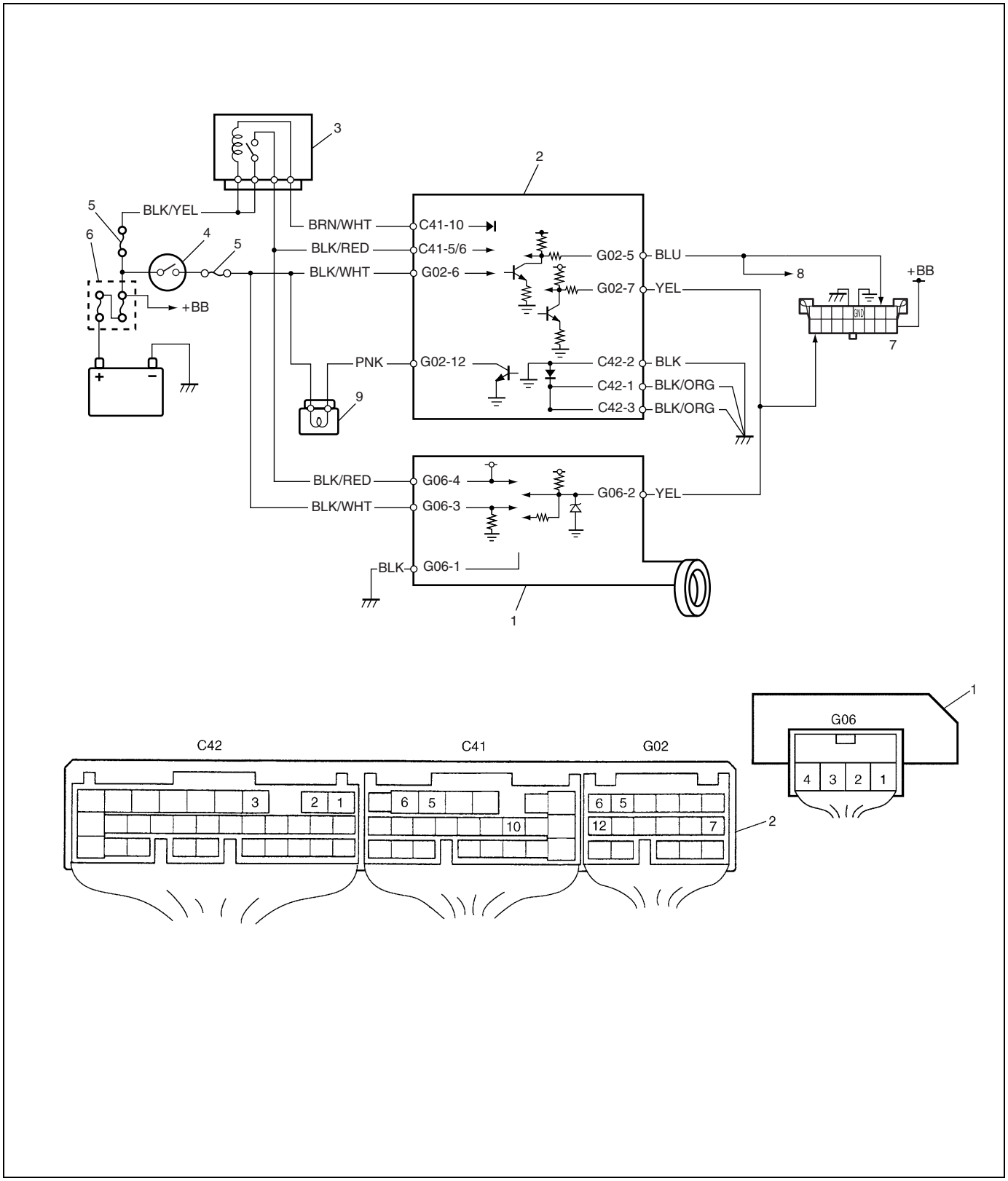
WIRING CIRCUIT



1. Immobilizer Control Module	4. Ignition switch	7. Data link connector
2. ECM	5. Fuse	8. To ABS control module, SDM and TCM
3. Main relay	6. Main fuse	9. Immobilizer indicator lamp

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ON-BOARD DIAGNOSTIC SYSTEM (SELF-DIAGNOSIS FUNCTION)

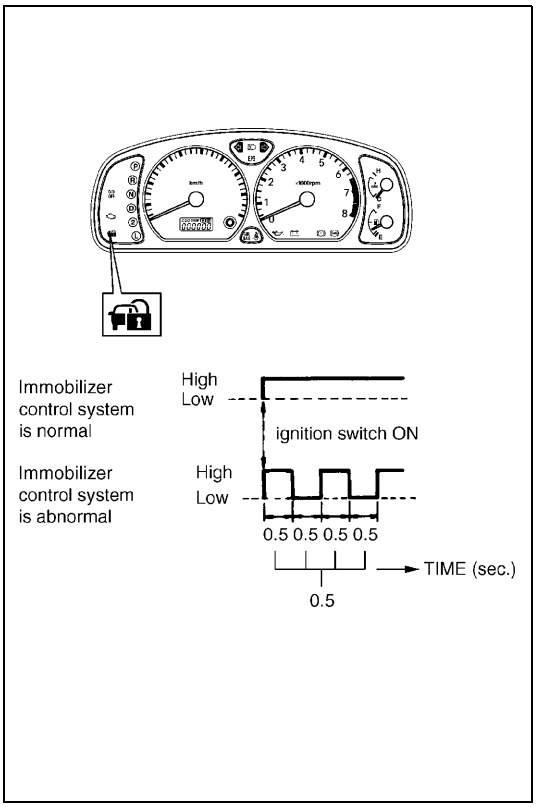
Immobilizer Control Module and ECM diagnose troubles which may occur in the area including the following parts when the ignition switch is ON.

ECM :

- ECM/Immobilizer Control Module code
- Serial data link circuit
- ECM

Immobilizer Control Module :

- Transponder code
- Coil antenna
- ECM/Immobilizer Control Module code
- Serial data link circuit
- Immobilizer Control Module
- Ignition signal



With the ignition switch turned ON (but the engine at stop) regardless of the condition of the engine and emission control system, ECM indicates whether a trouble has occurred in the immobilizer control system or not by causing the immobilizer indicator lamp to flash or turn ON.
Immobilizer indicator lamp is ON :
No trouble exists in the immobilizer control system.
Immobilizer indicator lamp is flashing :
ECM or Immobilizer Control Module has detected some trouble in the immobilizer control system.

NOTE:

As soon as the ignition switch is turned ON, ECM and Immobilizer Control Module diagnose if a trouble has occurred in the immobilizer control system. While the diagnosis is being made, the immobilizer indicator lamp stays ON and if the diagnosis result is "abnormal", it immediately changes to flashing but if the result is "normal", it remains ON. Diagnosis takes about 3 seconds at maximum.

When ECM and Immobilizer Control Module detects a trouble, it stores DTC corresponding to the exact trouble area in ECM and Immobilizer Control Module memory.

DTCs stored in memory of each controller (Immobilizer Control Module and ECM) can be read by using the procedure described in "DIAGNOSTIC TROUBLE CODE CHECK (IMMOBILIZER CONTROL MODULE)" and "DIAGNOSTIC TROUBLE CODE CHECK(ECM)" in this section.

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DIAGNOSIS

PRECAUTIONS IN DIAGNOSING TROUBLES

PRECAUTIONS IN IDENTIFYING DIAGNOSTIC TROUBLE CODE

ECM

- Before identifying diagnostic trouble code indicated through Suzuki scan tool, don't disconnect couplers from ECM, battery cable from battery, ECM ground wire harness from engine.
  Such disconnection will clear trouble codes for engine and emission control system and immobilizer control system stored in memory of ECM.
- Take a note of diagnostic trouble code indicated first.

IMMOBILIZER CONTROL MODULE

- Take a note of diagnostic trouble code indicated first.

INTERMITTENT TROUBLES

- There is case where Suzuki scan tool indicate a diagnostic trouble code representing a trouble which occurred only temporarily and has gone. In such case, it may occur that good parts are replaced unnecessarily. To prevent such accident, be sure to follow instructions given below when checking by using “Diagnostic Flow Table”.
  – When trouble can be identified, it is not an intermittent one :
    Check coil antenna, ignition key, wires and each connection and if they are all in good condition, substitute a known-good ECM and recheck.
  – When trouble can not be identified but Suzuki scan tool indicate a trouble code :
    Diagnose trouble by using that code No. and if ignition key, coil antenna, wires and each connection are all in good condition, turn OFF ignition switch and then ON.

Then check what Suzuki scan tool indicate.Only when they indicate trouble code again, substitute a known-good ECM or Immobilizer Control Module and check again.
If they indicate not trouble code but normal code, it means that an intermittent trouble did occur and has gone. In this case, check wires and connections carefully again.

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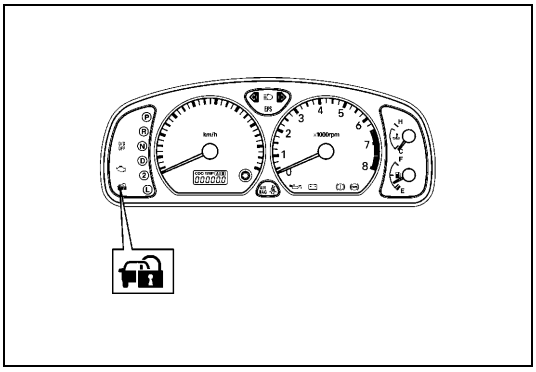
DIAGNOSTIC FLOW TABLE

Step	Action	Yes	No
1	1) Check immobilizer indicator lamp while ignition switch is ON (but without starting engine). See Fig. 1. Does immobilizer indicator lamp flash?	Go to Step 3.	If immobilizer indicator lamp remains ON, go to Step 2. If immobilizer indicator lamp remains OFF, go to "TABLE A IMMOBILIZER INDICATOR LAMP CHECK" in this section.
2	1) Check DTC stored in ECM referring to "DIAGNOSTIC TROUBLE CODE CHECK (ECM)" in this section. Is there any DTC(s)?	Go to "TABLE B IMMOBILIZER INDICATOR LAMP CHECK" in this section.	Immobilizer control system is in good condition.
3	1) Check DTC stored in immobilizer control module referring to "DIAGNOSTIC TROUBLE CODE CHECK (IMMOBILIZER CONTROL MODULE)" in this section. Is there any DTC(s)?	Go to flow table for DTC No.	Go to Step 4.
4	1) Check DTC stored in ECM referring to "DIAGNOSTIC TROUBLE CODE CHECK (ECM)" in this section. Is there any DTC(s) for immobilizer control system?	Go to flow table for DTC No.	Substitute a known-good ECM and recheck. See NOTE below.

NOTE:

After replacing with a known-good ECM, register ECM/Immobilizer Control Module code in ECM by performing procedure described in "Procedure after ECM Replacement" section.

Fig. 1 for Step 1



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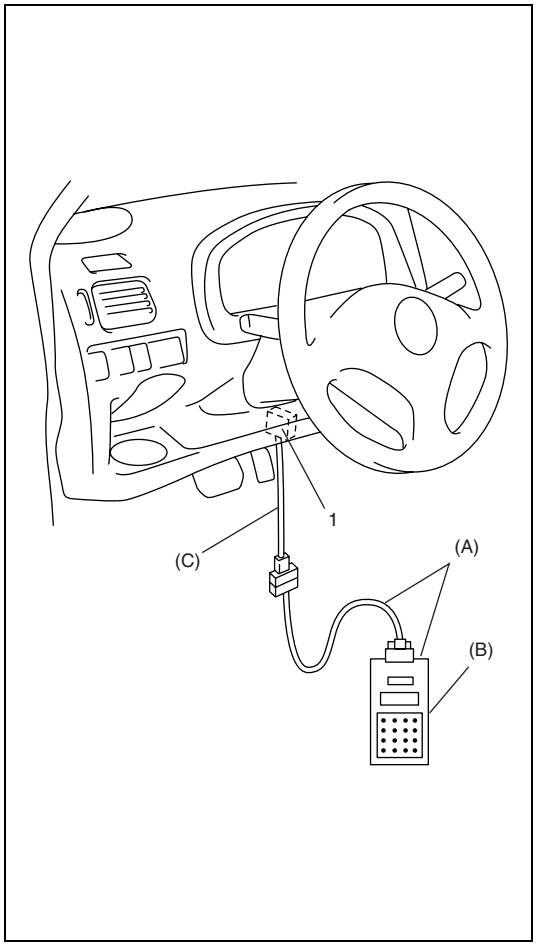
DIAGNOSTIC TROUBLE CODE (DTC) CHECK (IMMOBILIZER CONTROL MODULE)



1) Turn ignition switch OFF.
2) After setting cartridge to Suzuki scan tool, connect it to data link connector (DLC) (1) located on underside of instrument panel at driver's seat side.

Special tool
(A) : 09931-76011 (Suzuki scan tool)
(B) : Mass storage cartridge
(C) : 09931-76030 (16/14 pin DLC cable)

3) Turn ignition switch ON.
4) Read DTC stored in immobilizer control module according to instructions displayed on Suzuki scan tool and print it or write it down. Refer to Suzuki scan tool operator's manual for further details.
   If communication between Suzuki scan tool and immobilizer control module is not possible, go to "Diagnostic Flow Table C".

NOTE:

When reading DTC stored in immobilizer control module using Suzuki scan tool, select "BCM" from the applications menu and "IMMOBILIZER" from the select system menu displayed on Suzuki scan tool.

5) After completing the check, turn ignition switch OFF and disconnect Suzuki scan tool from data link connector (DLC).

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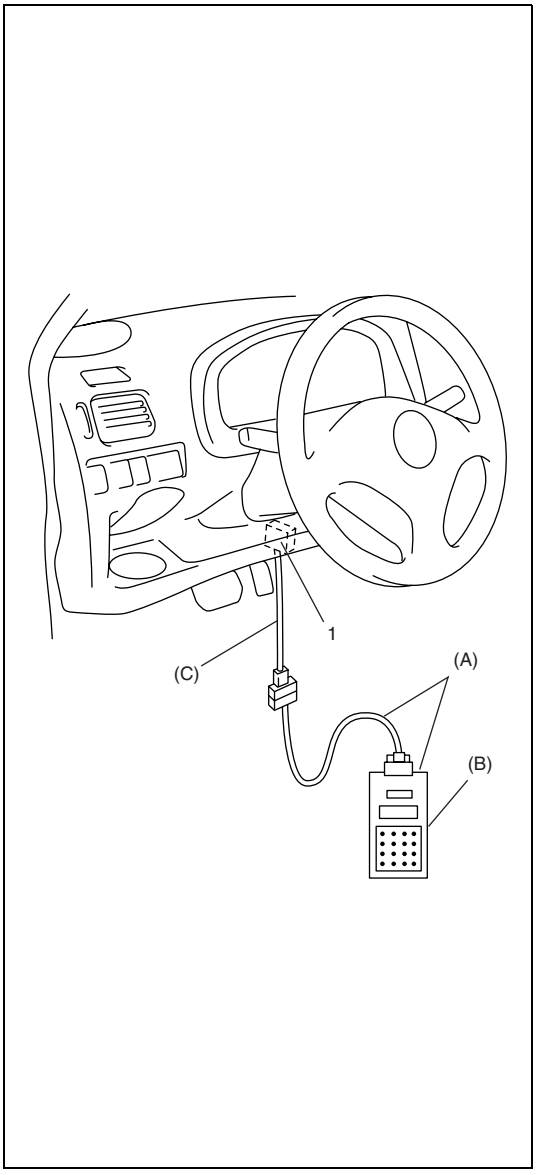
DIAGNOSTIC TROUBLE CODE (DTC) CHECK (ECM)



1) Turn ignition switch OFF.
2) After setting cartridge to Suzuki scan tool, connect it to data link connector (DLC) (1) located on underside of instrument panel at driver's seat side.

Special tool
(A) : 09931-76011 (Suzuki scan tool)
(B) : Mass storage cartridge
(C) : 09931-76030 (16/14 pin DLC cable)

3) Turn ignition switch ON.
4) Read DTC stored in ECM according to instructions displayed on Suzuki scan tool and print it or write it down. Refer to Suzuki scan tool operator's manual for further details.
   If communication between Suzuki scan tool and ECM is not possible, check if Suzuki scan tool is communicable by connecting it to ECM in another vehicle. If communication is possible in this case, Suzuki scan tool is in good condition. Then check data link connector and serial data line (circuit) in the vehicle with which communication was not possible.

NOTE:

- **When reading DTC stored in ECM using Suzuki scan tool, select "ECM" from the applications menu and "SUZUKI mode" from the communication mode menu displayed on Suzuki scan tool.**
- **If ECM detects a trouble in both engine and emission control system and immobilizer control system, Suzuki scan tool indicates trouble codes of both systems using Suzuki mode of ECM application.**

5) After completing the check, turn ignition switch OFF and disconnect Suzuki scan tool from data link connector (DLC).

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DIAGNOSTIC TROUBLE CODE TABLE

IMMOBILIZER CONTROL MODULE

DTC (indicated on Suzuki scan tool)	DIAGNOSTIC AREA	DIAGNOSIS
NO DTC	Normal (No code)	This code appears when none of the other codes are identified.
11	Transponder code	Diagnose trouble according to "Diagnostic Flow Table" corresponding to each code No.
31		
32		
12	Immobilizer Control Module	
13	Coil antenna or ignition key with built-in transponder	
21	ECM/Immobilizer Control Module code	
22	Ignition switch circuit	
23	Serial data link circuit	

ECM

DTC (indicated on Suzuki scan tool)	DIAGNOSTIC AREA	DIAGNOSIS
NO DTC	Normal	This code appears when it is confirmed that none of other trouble codes is set for immobilizer control system or engine and emission control system.
P1623	ECM/Immobilizer Control Module code	Diagnose trouble according to "DIAGNOSTIC FLOW TABLE" corresponding to each code No.
P1620		
P1622	ECM	
P1621	Serial data link wire	

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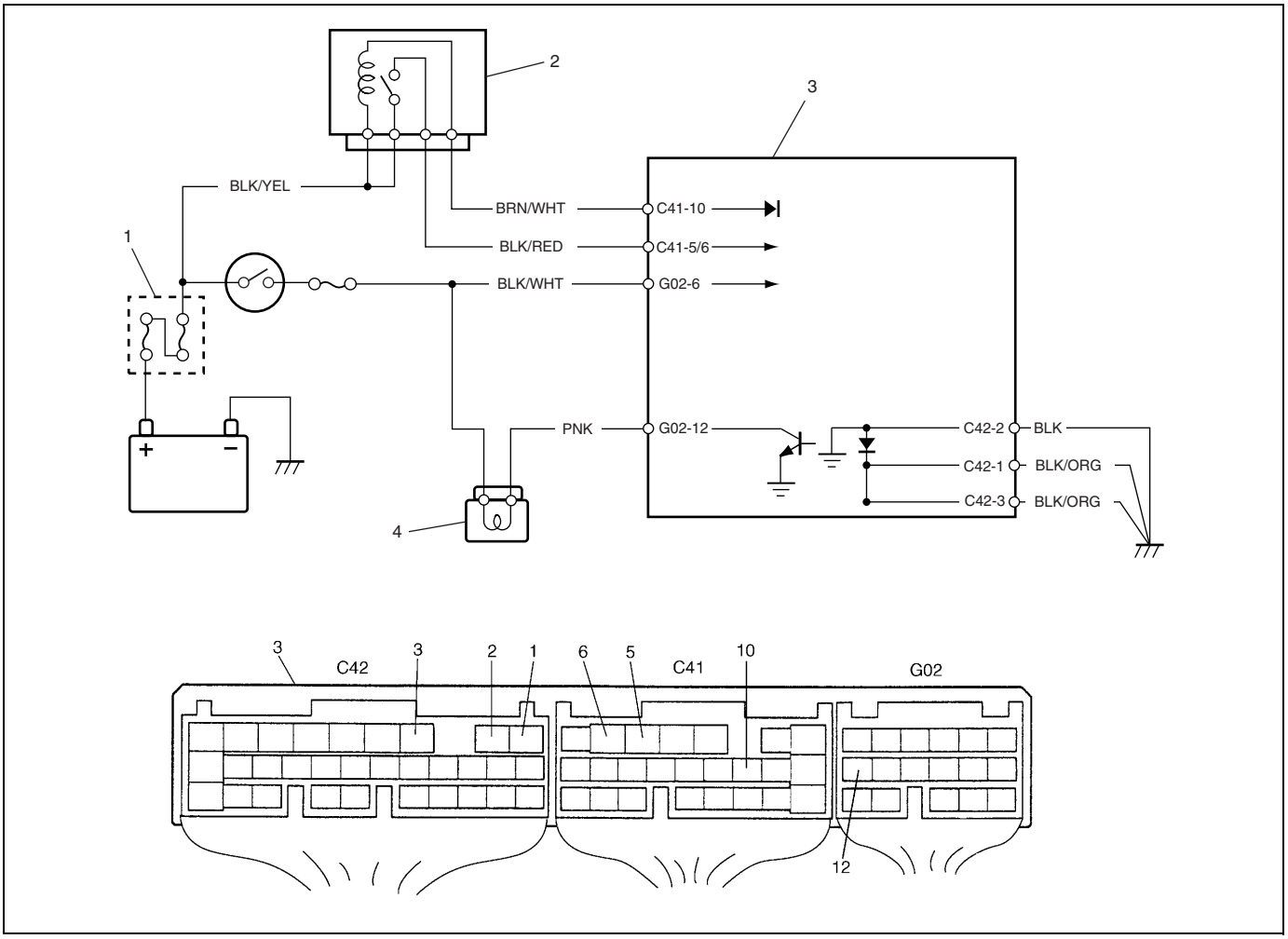
TABLE A - IMMOBILIZER INDICATOR LAMP CHECK (IMMOBILIZER INDICATOR LAMP DOES NOT LIGHT AT IGNITION SWITCH ON)

WIRING DIAGRAM



1. Main fuse	2. Main relay	3. ECM	4. Immobilizer indicator lamp

INSPECTION

Step	Action	Yes	No
1	1) Turn ignition switch ON. Do other indicator/warning lights in combination meter come ON?	Go to Step 2.	"IG" fuse blown, main fuse blown, ignition switch malfunction, "BLK/WHT" circuit between "IG" fuse and combination meter or poor coupler connection at combination meter.
2	1) Turn ignition switch OFF and disconnect connectors from ECM. 2) Check for proper connection to ECM at terminal G02-12. 3) If OK, then using service wire, ground terminal G02-12 in connector disconnected. Does immobilizer indicator lamp turn on at ignition switch ON?	Substitute a known-good ECM and recheck.	Bulb burned out or "PNK" wire circuit open.

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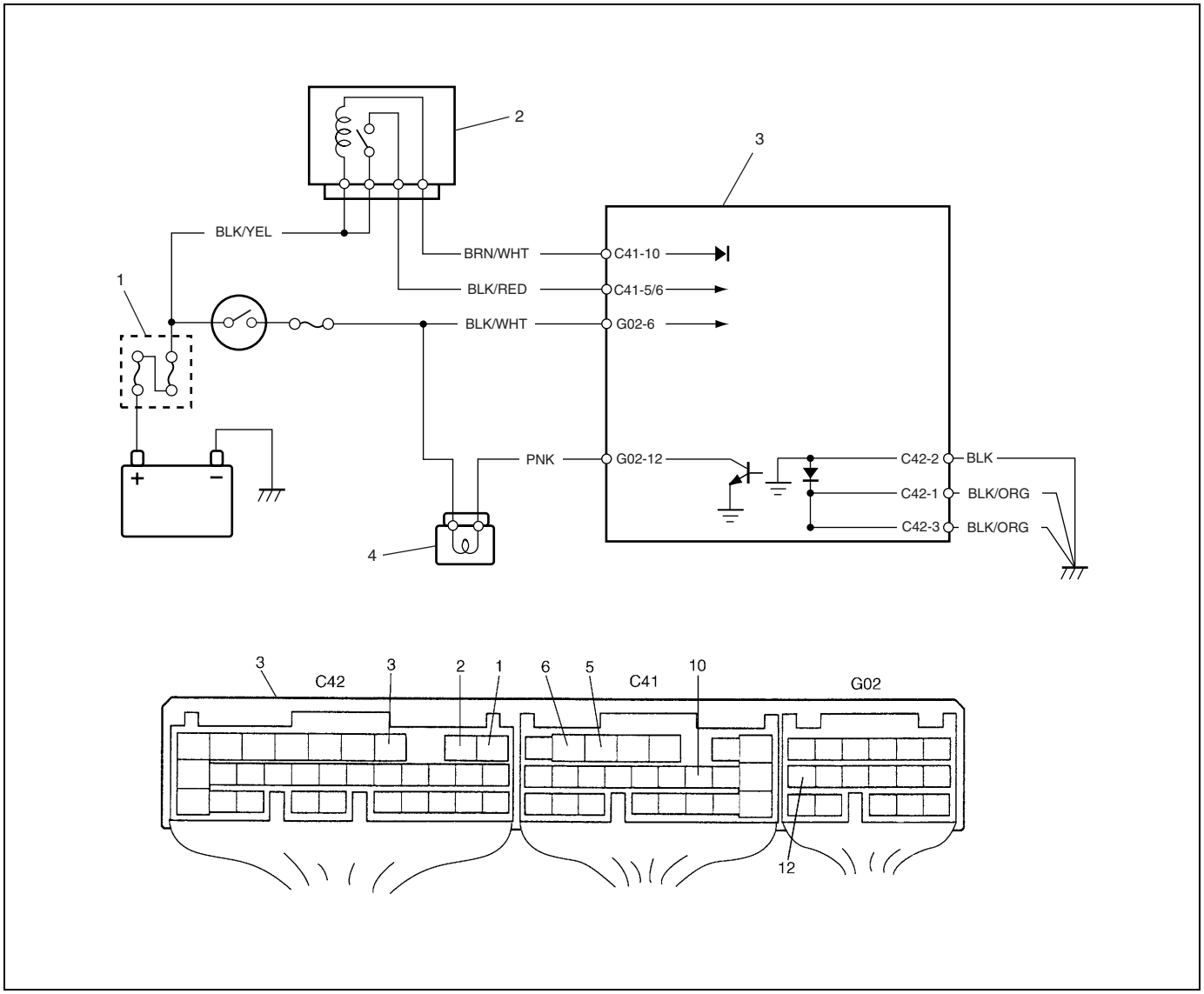
TABLE B - IMMOBILIZER INDICATOR LAMP CHECK (IMMOBILIZER INDICATOR LAMP REMAINS ON AFTER ENGINE STARTS)

WIRING DIAGRAM



1. Main fuse	2. Main relay	3. ECM	4. Immobilizer indicator lamp

INSPECTION

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect couplers from ECM. Does immobilizer indicator lamp turn ON at ignition switch ON?	"PNK" wire shorted to ground circuit.	Substitute a known-good ECM and recheck.

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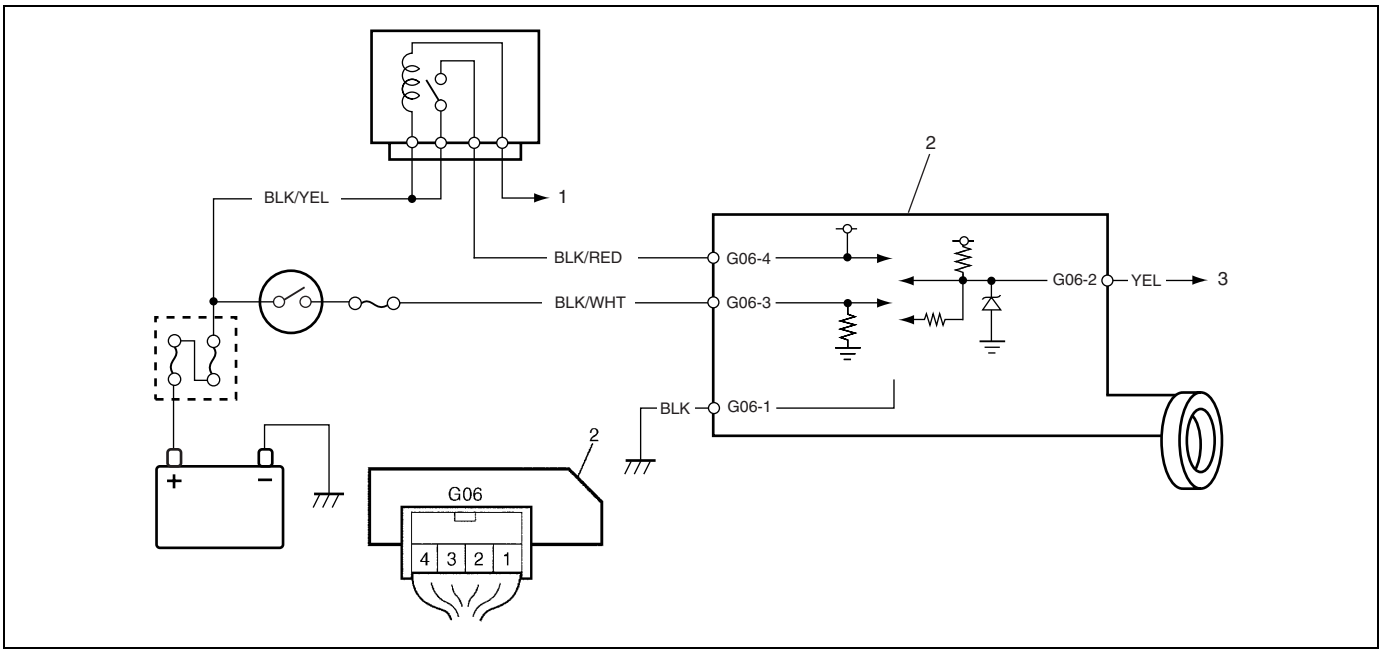
TABLE C - DTC IS NOT OUTPUT FROM IMMOBILIZER CONTROL MODULE

WIRING DIAGRAM



1. To ECM	2. Immobilizer control module	3. To #9-pin in DLC

INSPECTION

Step	Action	Yes	No
1	Check voltage between G06-4 terminal and body ground with ignition switch turned ON. See Fig 1. Is it 10 – 14 V?	Go to Step 2.	"BLK/RED" wire open or short to ground.
2	1) Disconnect coupler (1) at immobilizer control module. Is there continuity between coupler terminal G06-1 and body ground? See Fig 2.	• Poor G06-4 or G06-1 connection • Poor #9-pin connection in DLC • Serial data line "YEL" open or short to ground If connections and line are OK, substitute a known-good Immobilizer Control Module and recheck. See NOTE below.	"BLK" wire open.

NOTE:

After replacing with a known-good Immobilizer Control Module, register ECM/Immobilizer Control Module code in ECM and Transponder code and ECM/Immobilizer Control Module code in Immobilizer Control Module by performing procedure described in "PROCEDURE AFTER IMMOBILIZER CONTROL MODULE REPLACEMENT" in this section.

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Fig. 1 for Step 1

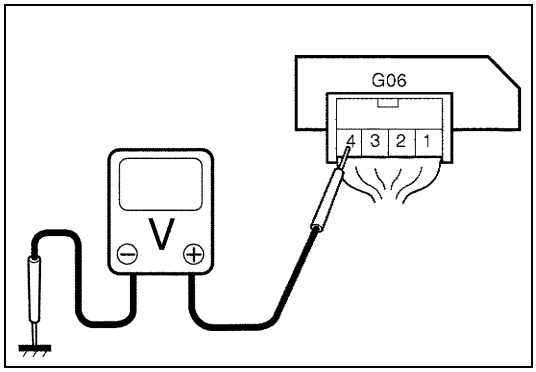
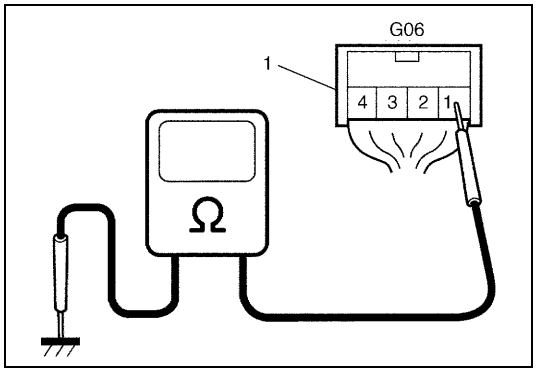


Fig. 2 for Step 2



DTC11/32 TRANSPONDER CODE NOT MATCHED

DESCRIPTION

Immobilizer Control Module checks if Transponder code transmitted from ignition key and that registered in Immobilizer Control Module match when ignition switch is ON. If they do not, DTC 11 and/or 32 are set.

INSPECTION

Register ignition key with built-in transponder by using SUZUKI scan tool and performing following steps.

1) Register Transponder code in Immobilizer Control Module by performing procedure described in “How To Register Ignition Key”.
2) Turn ignition switch OFF, then turn it ON and check that DTC11 and/or 32 are not set.

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DTC31 TRANSPONDER CODE NOT REGISTERED

DESCRIPTION

Immobilizer Control Module checks if Transponder code transmitted from ignition key and that registered in Immobilizer Control Module match when ignition switch is ON. If there is no Transponder code registered in Immobilizer Control Module, this DTC is set.

INSPECTION

Register ignition key with built-in transponder by using SUZUKI scan tool and performing following steps.

1) Register Transponder code in Immobilizer Control Module by performing procedure described in “How To Register Ignition Key”.
2) Turn ignition switch OFF, then turn it ON and check that DTC31 is not set.

DTC12 FAULT IN IMMOBILIZER CONTROL MODULE

DESCRIPTION

This DTC is set when an internal fault is detected in Immobilizer Control Module.

INSPECTION

Step	Action	Yes	No
1	1) Ignition switch OFF. 2) Disconnect connectors from Immobilizer Control Module. 3) Check for proper connection to Immobilizer Control Module at all terminals. Are they in good condition?	Substitute a known-good Immobilizer Control Module and recheck. See NOTE below.	Repair or replace.

NOTE:

After replacing with a known-good Immobilizer Control Module, register ECM/Immobilizer Control Module code in ECM and Transponder code and ECM/Immobilizer Control Module code in Immobilizer Control Module by performing procedure described in “PROCEDURE AFTER IMMOBILIZER CONTROL MODULE REPLACEMENT” in this section.

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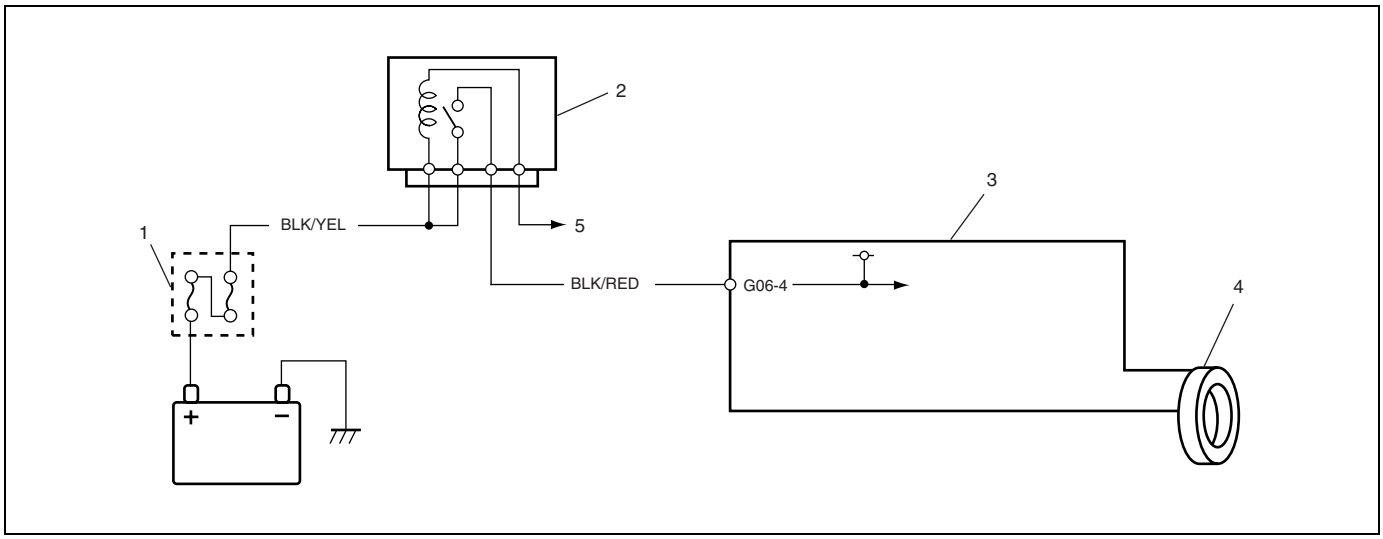
DTC13 NO TRANSPONDER CODE TRANSMITTED OR COIL ANTENNA OPENED/SHORTED



1. Main fuse	2. Main relay	3. Immobilizer Control Module	4. Coil antenna	5. To ECM

DESCRIPTION

Immobilizer Control Module energizes the coil antenna when the ignition switch is ON and reads Transponder code from the ignition key. When Immobilizer Control Module cannot read Transponder code from the ignition key even when the coil antenna is energized, this DTC is set.

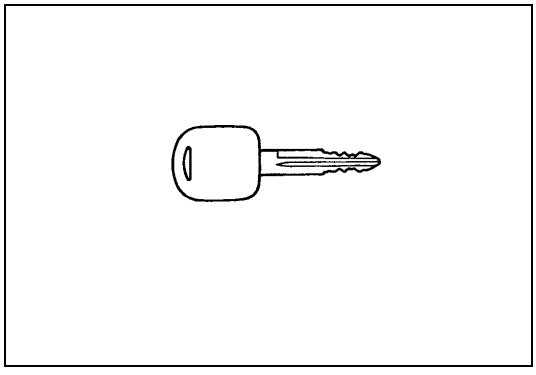
INSPECTION

Step	Action	Yes	No
1	Check that knob shape and color for ignition key are as shown below. • Knob color : Dark gray • Knob shape : the same as shown in Fig.1. Is it the original one?	Substitute a known-good Immobilizer Control Module and recheck. See NOTE below.	Replace ignition key with original one and follow “Diagnostic Flow Table” again.

NOTE:

After replacing with a known-good Immobilizer Control Module, register ECM/Immobilizer Control Module code in ECM and Transponder code and ECM/Immobilizer Control Module code in Immobilizer Control Module by performing procedure described in “PROCEDURE AFTER IMMOBILIZER CONTROL MODULE REPLACEMENT” in this section.

Fig. 1 for Step 1



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DTC21 ECM/IMMOBILIZER CONTROL MODULE CODE NOT MATCHED (IMMOBILIZER CONTROL MODULE SIDE)

DTC P1623 ECM/IMMOBILIZER CONTROL MODULE CODE NOT MATCHED (ECM SIDE)

DTC P1620 ECM/IMMOBILIZER CONTROL MODULE CODE NOT REGISTERED

DESCRIPTION

- DTC21
  Immobilizer Control Module checks if ECM/Immobilizer Control Module code transmitted from ECM and that registered in Immobilizer Control Module match when ignition switch is ON. If they do not, this DTC is set.
- DTC P1623
  ECM checks if ECM/Immobilizer Control Module code transmitted from Immobilizer Control Module and that registered in ECM match when ignition switch is ON. If they do not, this DTC is set.
- DTC P1620
  ECM checks if code transmitted from Immobilizer Control Module and that registered in ECM match when ignition switch is ON. If there is no ECM/Immobilizer Control Module code registered in ECM, this DTC is set.

INSPECTION

Perform procedure described in “PROCEDURE AFTER ECM REPLACEMENT” in the section.

DTC P1622 FAULT IN ECM

DESCRIPTION

This DTC is set when an internal fault is detected in ECM.

INSPECTION

Step	Action	Yes	No
1	1) Ignition switch OFF. 2) Disconnect connectors from ECM. 3) Check for proper connection to ECM at all terminals. Are they in good condition?	Substitute a known-good ECM and recheck. See NOTE below.	Repair or replace.

NOTE:

After replacing with a known-good ECM, register ECM/Immobilizer Control Module code in ECM by performing procedure described in “PROCEDURE AFTER ECM REPLACEMENT” in this section.

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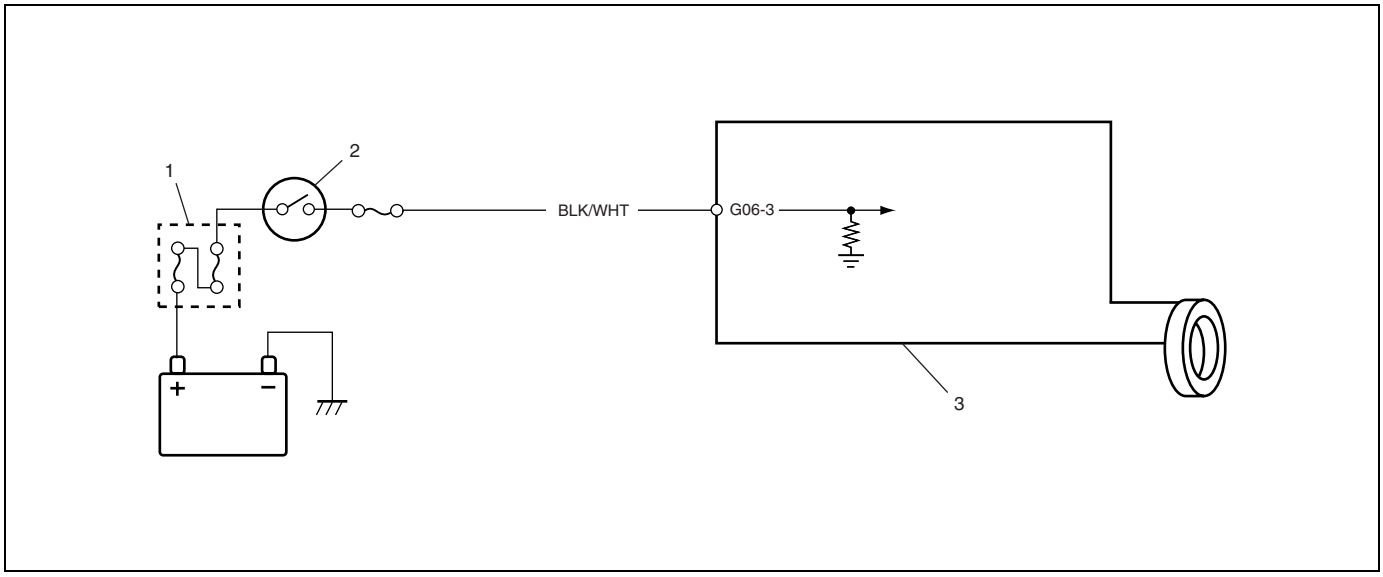
DTC22 IGNITION SWITCH CIRCUIT OPEN/SHORT



1. Main fuse	2. Ignition switch	3. Immobilizer Control Module

DESCRIPTION

Immobilizer Control Module monitors ignition signal when the ignition switch is ON. This DTC is set when no ignition signal input is detected by Immobilizer Control Module.

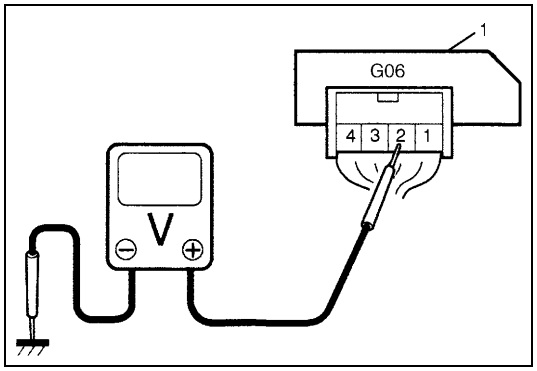
INSPECTION

Step	Action	Yes	No
1	Check voltage between Immobilizer Control Module (1) coupler terminal G06-3 and body ground with ignition switch turned ON. (See Fig. 1) Is it 10 – 14V?	Poor G06-3 terminal connection. If connection is OK, substitute a known-good Immobilizer Control Module and recheck. See NOTE below.	"BLK/WHT" wire open or short.

NOTE:

After replacing with a known-good Immobilizer Control Module, register ECM/Immobilizer Control Module code in ECM and Transponder code and ECM/Immobilizer Control Module code in Immobilizer Control Module by performing procedure described in "PROCEDURE AFTER IMMOBILIZER CONTROL MODULE REPLACEMENT" in this section.

Fig. 1 for Step 1



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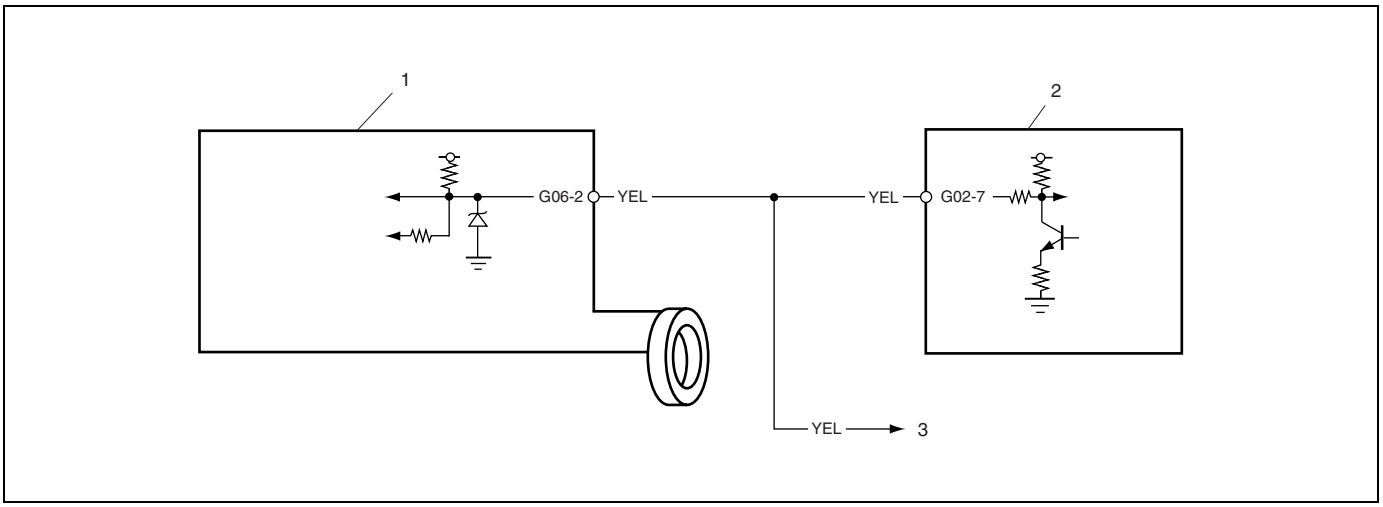
DTC23 NO ECM/IMMOBILIZER CONTROL MODULE CODE TRANSMITTED FROM ECM OR DLC CIRCUIT OPENED/SHORTED

DTC P1621 NO ECM/IMMOBILIZER CONTROL MODULE CODE TRANSMITTED FROM IMMOBILIZER CONTROL MODULE OR DLC CIRCUIT OPENED/ SHORTED



1. Immobilizer Control Module	2. ECM	3. To #9-pin in DLC

DESCRIPTION

When the ignition switch is ON, Immobilizer Control Module requests ECM and ECM requests Immobilizer Control Module to transmit ECM/Immobilizer Control Module code. If ECM/Immobilizer Control Module code is not transmitted from ECM or Immobilizer Control Module, Immobilizer Control Module sets DTC23 and ECM sets DTC P1621.

INSPECTION

Step	Action	Yes	No
1	Check voltage between Immobilizer Control Module (1) coupler terminal G06-2 and body ground with ignition switch turned ON. Is it 4 – 5V?	Go to Step 2.	"YEL" wire short.
2	1) Disconnect ECM coupler with ignition switch turned OFF. 2) Is there continuity between Immobilizer Control Module coupler (1) terminal G06-2 and serial data link terminal (G02-7) of ECM coupler? (For positions of Data link connector terminal of ECM coupler, refer to "WIRING CIRCUIT" in this section.)	Poor G06-2 terminal connection (Immobilizer Control Module) or Poor Data link connector terminal connection (ECM). If connections are OK, substitute a known-good ECM or Immobilizer Control Module and recheck. See NOTE below.	"YEL" wire between Immobilizer Control Module and ECM open.

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NOTE:

- **After replacing with a known-good ECM, register ECM/Immobilizer Control Module code in ECM by performing procedure described in "PROCEDURE AFTER ECM REPLACEMENT" in this section.**
- **After replacing with a known-good Immobilizer Control Module, register ECM/Immobilizer Control Module code in ECM and Transponder code and ECM/Immobilizer Control Module code in Immobilizer Control Module by performing procedure described in "PROCEDURE AFTER IMMOBILIZER CONTROL MODULE REPLACEMENT" in the section.**

Fig. 1 for Step 1

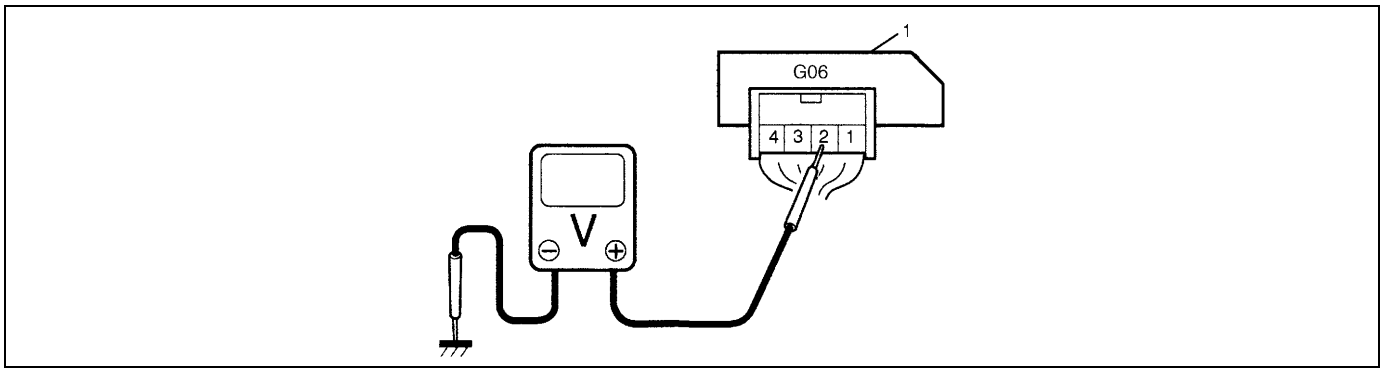
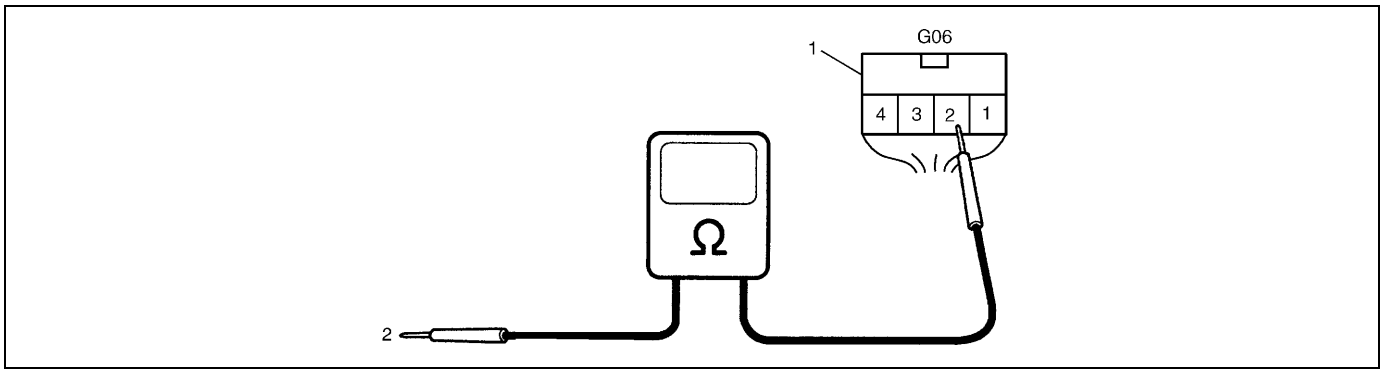


Fig. 2 for Step 2



2. Connect to serial data link terminal (G02-7) of ECM coupler disconnected

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INSPECTION OF ECM, IMMOBILIZER CONTROL MODULE AND ITS CIRCUIT

ECM, Immobilizer Control Module and its circuit can be checked at ECM wiring couplers and Immobilizer Control Module wiring coupler by measuring voltage. Described here is only inspection of Immobilizer Control Module. For inspection of ECM, refer to "ENGINE & EMISSION CONTROL INPUT/OUTPUT TABLE" in Section 6E1.

CAUTION:

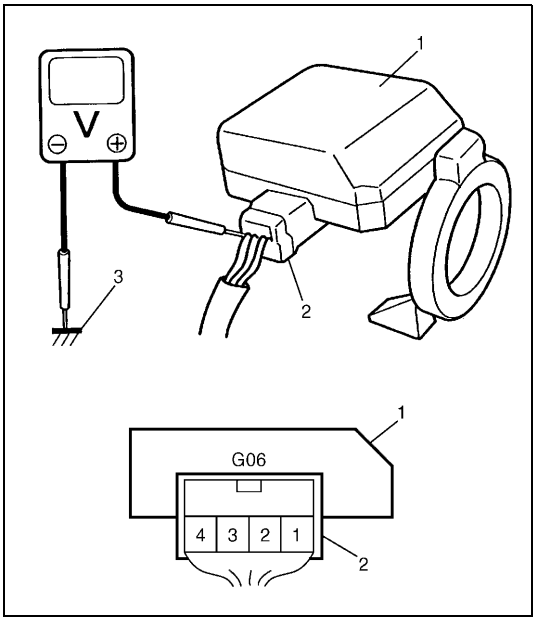
Immobilizer Control Module cannot be checked by itself. It is strictly prohibited to connect voltmeter or ohmmeter to Immobilizer Control Module with coupler disconnected from it.

Voltage Check

1) Remove Immobilizer Control Module from steering lock assembly with ignition switch OFF, referring to "REMOVAL" of "IMMOBILIZER CONTROL MODULE" in this section.
2) Connect Immobilizer Control Module coupler to Immobilizer Control Module.
3) Check voltage at each terminal of coupler connected.

NOTE:

As each terminal voltage is affected by the battery voltage, confirm that it is 11V or more when ignition switch is ON.



1.	Immobilizer Control Module
2.	Immobilizer Control Module coupler
3.	Body ground

TERMINAL	CIRCUIT	NOMAL VOLTAGE	CONDITION
G06-1	Ground	–	–
G06-2	Data link connector (Serial data terminal)	4 – 5V	Ignition switch ON
G06-3	Ignition signal	10 – 14V	Ignition switch ON
		0 – 0.8V	Ignition switch OFF
G06-4	Power source	10 – 14V	Ignition switch ON

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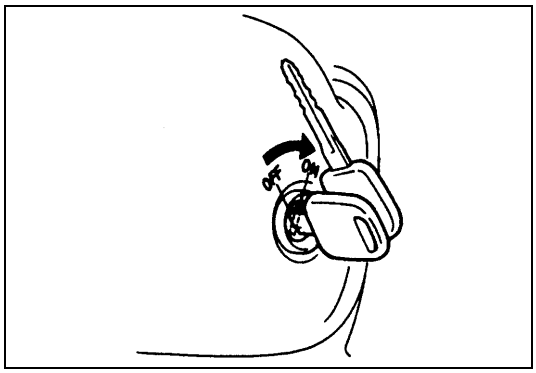
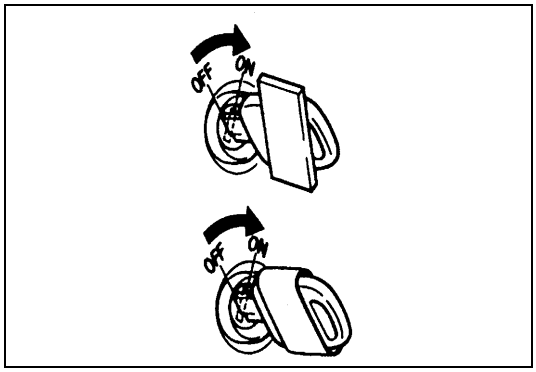
ON-VEHICLE SERVICE

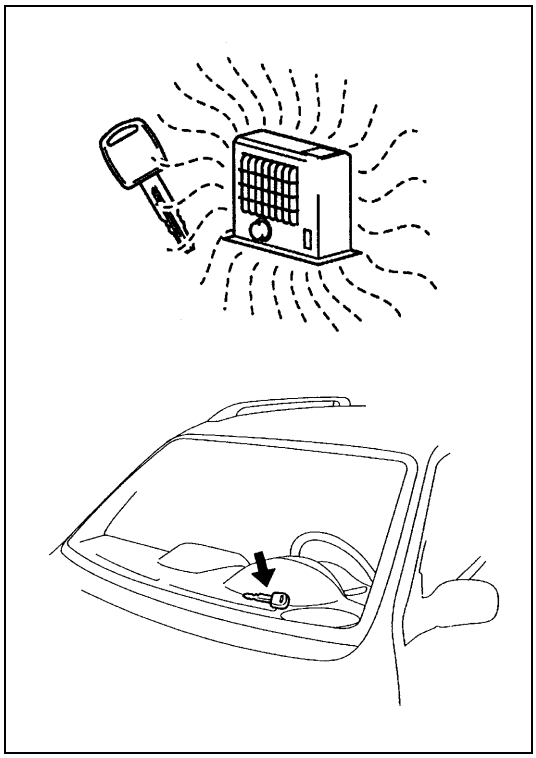
PRECAUTIONS IN HANDLING IMMOBILIZER CONTROL SYSTEM



- Don't turn ON ignition switch with ignition key for immobilizer control system put together with another one or placed quite close to another one. Or the system may detect abnormal condition and prevent engine from starting.



- Do not turn ON ignition switch by using ignition key with any type of metal wound around its grip or in contact with it. Or the system may detect abnormal condition and prevent engine from starting.



- Do not leave ignition key where high temperature is anticipated.High temperature will cause transponder in ignition key to be abnormal or damaged.

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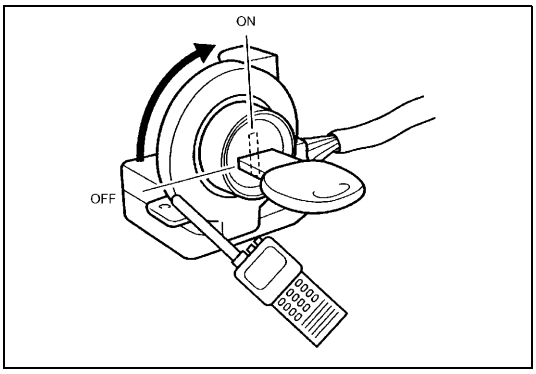
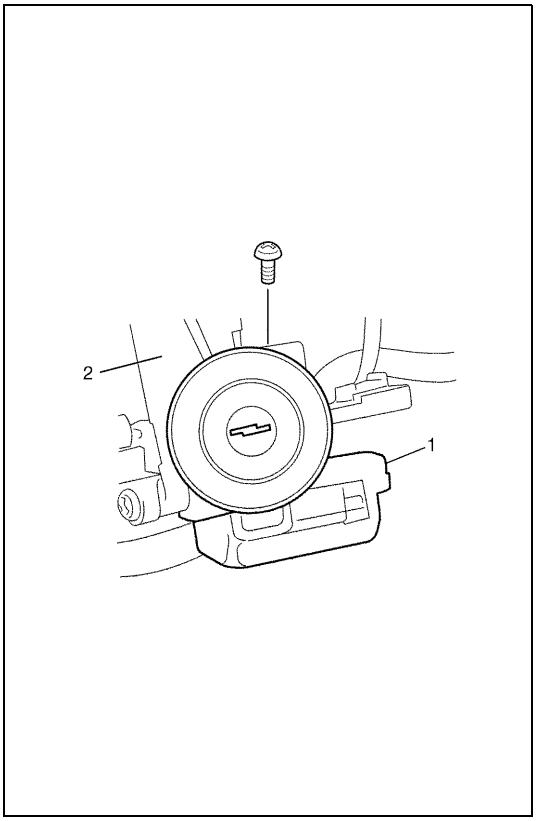


- Do not turn ON ignition switch with a radio antenna placed near Immobilizer Control Module. Or the system may detect abnormal condition and prevent engine from starting.

IMMOBILIZER CONTROL MODULE

REMOBAL

1) Disconnect negative (–) cable at battery.
2) Remove steering column upper and lower cover.
3) Disconnect coupler at Immobilizer Control Module.
4) Remove immobilizer control module (1) from steering lock assembly (2) after removing instrument cluster panel.



NOTE:

If a screwdriver whose length is 40mm or less is used, the immobilizer control module can be removed without removing the instrument cluster panel.

INSTALLATION

Reverse removal procedure for installation.

NOTE:

After replacing Immobilizer Control Module, be sure to register Transponder code and ECM/Immobilizer Control Module code in Immobilizer Control Module and ECM/ Immobilizer Control Module code in ECM by performing procedure described in "PROCEDURE AFTER IMMOBILIZER CONTROL MODULE REPLACEMENT" in this section.

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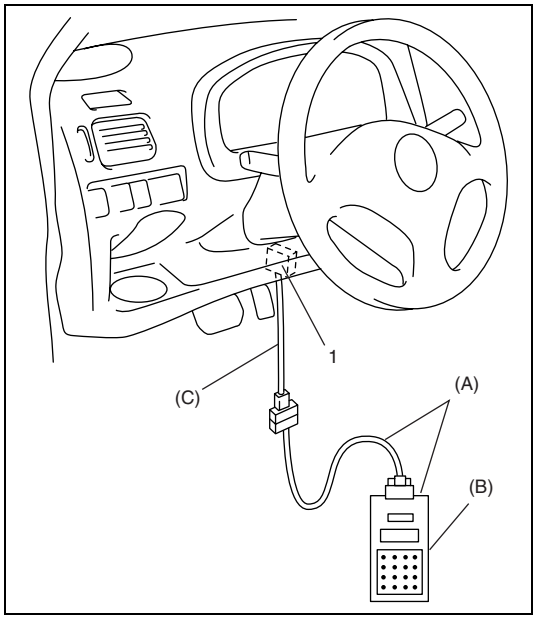
HOW TO REGISTER IGNITION KEY

Register the ignition key with a built-in transponder in Immobilizer Control Module by using the following procedure.

CAUTION:

When registering the ignition key including a transponder into the immobilizer control module by using Suzuki scan tool, confirm that the knob color of the ignition key to be registered for the vehicle is dark gray. The ignition key with wrong knob color cannot be registered.

1) Prepare SUZUKI scan tool and cartridge for immobilizer control system.

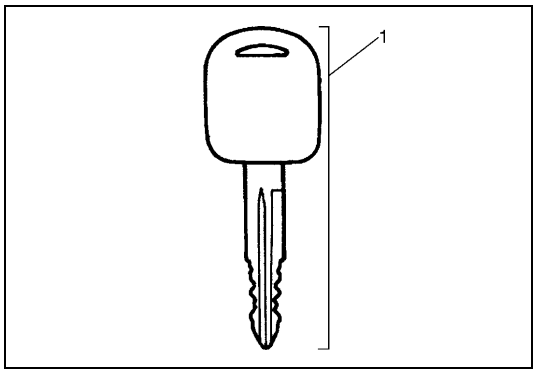


2) With ignition switch OFF, connect SUZUKI scan tool to data link connector (DLC) (1) located on underside of instrument panel at driver's seat side.

(A) : 09931-76011 (SUZUKI scan tool)
(B) : Immobilizer cartridge
(C) : 09931-76030 (16/14 pin DLC cable)

NOTE:

For operation procedure of SUZUKI scan tool, refer to SUZUKI scan tool operator's manual.



3) Prepare ignition key with a built-in transponder (1). And then turn ignition switch ON by using it.
4) Number of Transponder codes for ignition key with a built-in transponder that can be registered in Immobilizer Control Module is limited to 4. If needed, clear all Transponder codes for ignition key with a built-in transponder that have been registered in Immobilizer Control Module by executing the "CLR. TRANS COD (CLEAR TP CODE)" command in the SELECT MODE menu by using SUZUKI scan tool.

NOTE:

When "CLR. TRANS COD (CLEAR TP CODE)" command is executed with the immobilizer indicator lamp ON, it remains ON even after execution of that command is over. It will start flashing when the ignition switch is turned OFF once and then turned ON after some seconds.

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5) Using SUZUKI scan tool, register Transponder code in Immobilizer Control Module by executing “ENT. TRANS COD (ENT. TP CODE)” command in SELECT MODE menu.
6) Make sure that immobilizer indicator lamp lights when ignition switch is turned OFF once and then ON.
7) If any other Transponder code for ignition key with a built-in transponder needs to be registered, repeat above steps 3), 5) and 6).

NOTE:

- **Up to 4 Transponder codes for ignition key with a built-in transponder can be registered.**
- **It is not possible to register the same Transponder code for ignition key with a built-in transponder as the one already registered in Immobilizer Control Module.**

PROCEDURE AFTER IMMOBILIZER CONTROL MODULE REPLACEMENT

When Immobilizer Control Module was replaced, including when replaced because rechecking by using a known-good Immobilizer Control Module was necessary during trouble diagnosis, register Transponder code and ECM/Immobilizer Control Module code in Immobilizer Control Module and ECM/Immobilizer Control Module code in ECM by performing following procedure.

CAUTION:

When registering the ignition key including a transponder into the immobilizer control module by using Suzuki scan tool, confirm that the knob color of the ignition key to be registered for the vehicle is dark gray. The ignition key with wrong knob color cannot be registered.

1) Perform steps 1) and 2) described in “How To Register Ignition Key”.
2) Prepare ignition key with a built-in transponder. And then turn ignition switch ON by using it.
3) Using SUZUKI scan tool, clear all transponder codes registered in Immobilizer Control Module by executing “CLR. TRANS COD (CLEAR TP CODE)” command in SELECT MODE menu.

NOTE:

When “CLR. TRANS COD (CLEAR TP CODE)” command is executed with the immobilizer indicator lamp ON, it remains ON even after execution of that command is over. It will start flashing when the ignition switch is turned OFF once and then turned ON after some seconds.

4) Using SUZUKI scan tool, register Transponder code in Immobilizer Control Module by executing “ENT. TRANS COD (ENT. TP CODE)” command in SELECT MODE menu.
5) Using SUZUKI scan tool, register ECM/Immobilizer Control Module code in both Immobilizer Control Module and ECM by executing “RECORD ECU (RECORD ECM/PCM/ICM)” command in SELECT MODE menu.
6) Make sure that immobilizer indicator lamp lights when ignition switch is turned OFF once and then ON.
7) If any other Transponder code for ignition key with a built-in transponder needs to be registered, repeat above steps 2), 4) and 6).

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NOTE:

- **Up to 4 Transponder codes for ignition key with a built-in transponder can be registered.**
- **It is not possible to register the same Transponder code for ignition key with a built-in transponder as the one already registered in Immobilizer Control Module.**

PROCEDURE AFTER ECM REPLACEMENT

When ECM was replaced, including when replaced because rechecking by using a known-good ECM was necessary during trouble diagnosis, register ECM/Immobilizer Control Module code in ECM by performing following procedure.

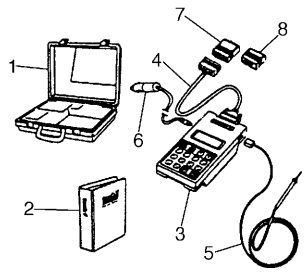
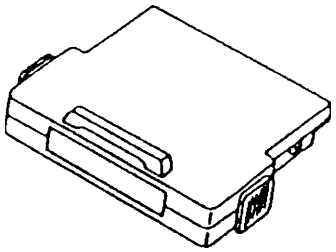
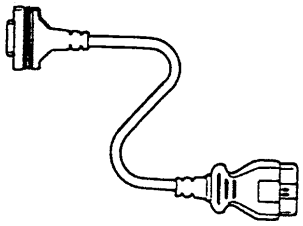
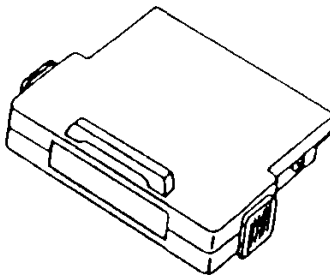
1) Perform steps 1) and 2) described in "How To Register Ignition Key". And then turn ignition switch ON.
2) Using SUZUKI scan tool, register ECM/Immobilizer Control Module code in ECM by executing "RECORD ECU (RECORD ECM/ICM)" command in SELECT MODE menu.

NOTE:

For operation procedure of SUZUKI scan tool, refer to SUZUKI scan tool operator's manual.

3) Make sure that malfunction indicator lamp lights when ignition switch is turned OFF once and then ON.

SPECIAL TOOL

			
09931-76011 Tech 1A kit See NOTE below.	Immobilizer cartridge of version 1.1 or more	09931-76030 16/14 pin DLC cable	Mass storage cartridge of version 1.5 or more

NOTE:

This kit includs the following items.

1. Storage case, 2. Operator's manual, 3. Tech 1A, 4. DLC cable, 5. Test lead/probe, 6. Power source cable, 7. DLC cable adaptor, 8. Self-test adaptor

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SECTION 9

BODY SERVICE

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to "Air Bag System Components and Wiring Location View" under "General Description" in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the "LOCK" position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**
- **When body servicing, if shock may be applied to air bag system component parts, remove those parts beforehand. (Refer to Section 10B.)**

NOTE:

Fasteners are important attaching parts in that they could affect the performance of vital components and systems, and / or could result in major repair expense. They must be replaced with one of the same part number of with an equivalent part if replacement becomes necessary.
Do not use a replacement part of lesser quality or substitute a design. Torque values must be used as specified during reassembly to assure proper retention of these parts.

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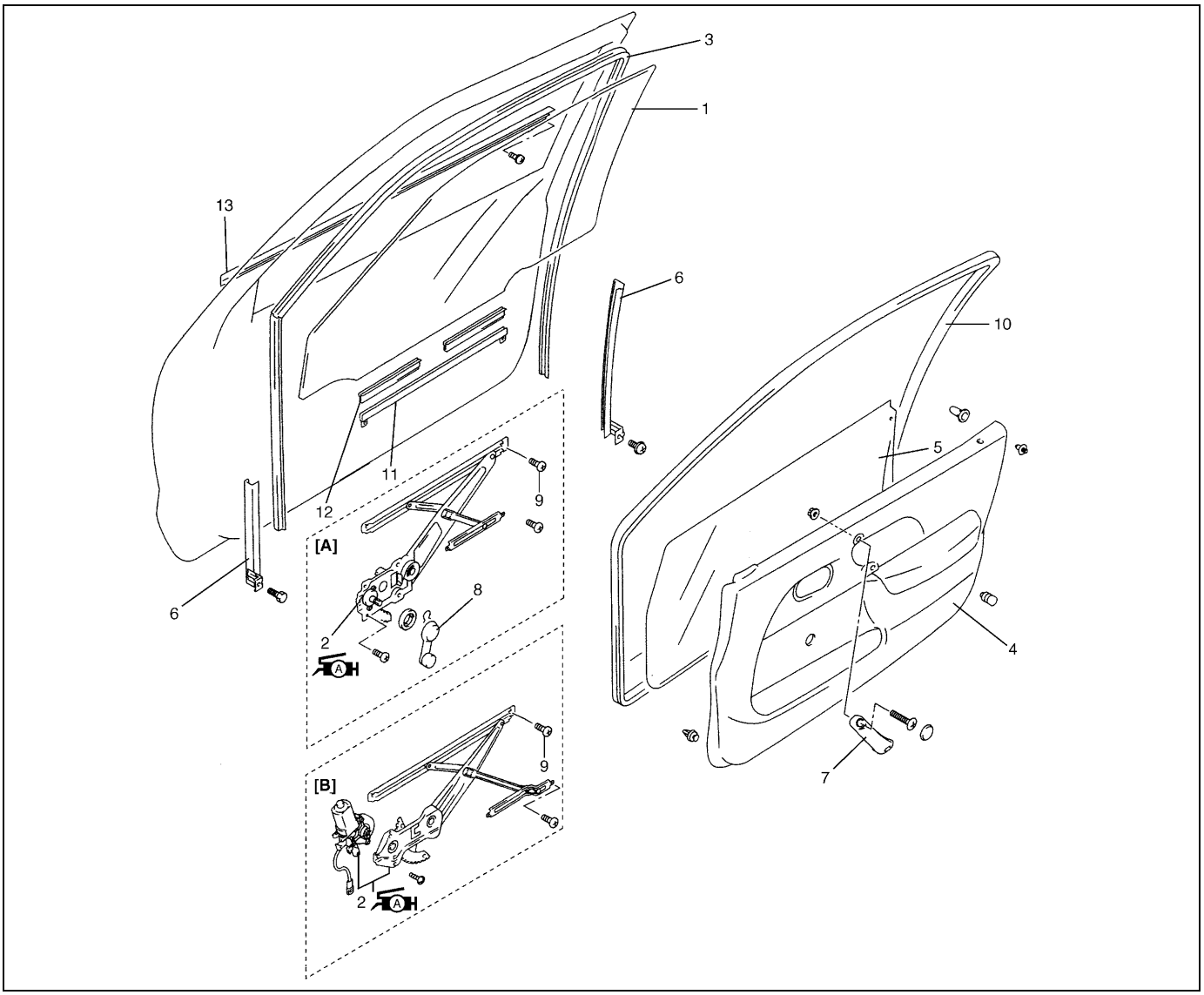
GLASS, WINDOWS AND MIRRORS

FRONT DOOR GLASS



	1. Door glass	6. Door sash	11. Glass bottom channel
A H	2. Window regulator assembly : Apply lithium grease 99000-25010 to sliding part.	7. Front door grip	12. Glass bottom rubber
	3. Glass run	8. Window regulator handle	13. Front door outer weather-strip
	4. Door trim	9. Bottom channel attaching screw	[A] Without power window model
	5. Door sealing cover	10. Door opening weather-strip	[B] With power window model

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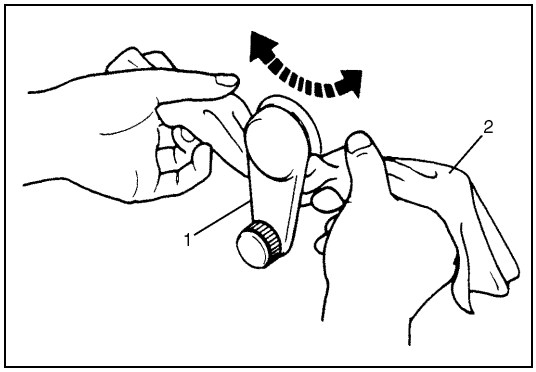
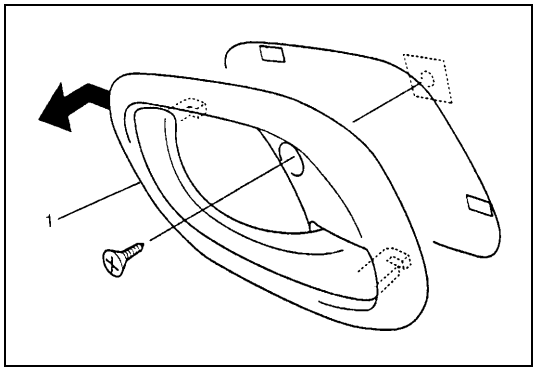
REMOVAL

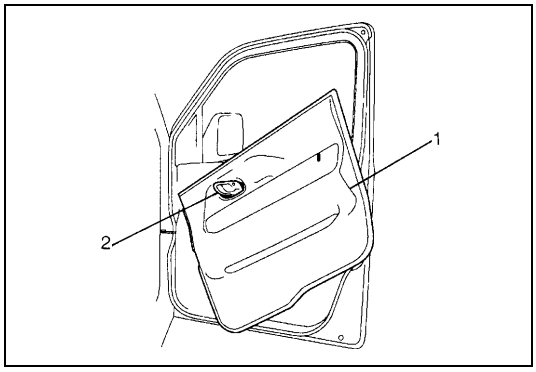


1) Remove window regulator handle (1) (if equipped).
   For its removal, pull off snap by using a cloth (2) as shown in figure.

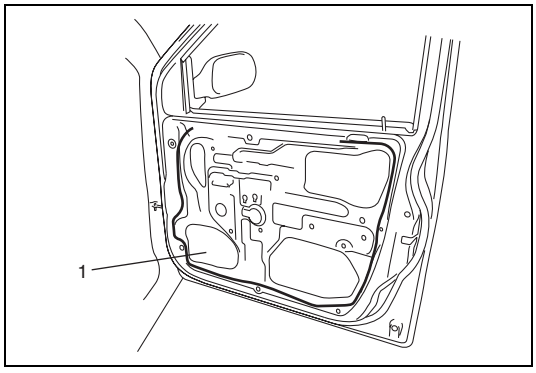


2) Remove inside handle bezel (1).

3) Remove inside door grip.
4) Remove mirror inner garnish.



5) Remove door trim (1).
   With inside handle bezel (2) tilted as shown in figure, turn door trim (1) 90° counterclockwise to remove it.
   And disconnect power window switch lead wire at coupler (if equipped).



6) Remove door sealing cover (1).
7) Remove door mirror.
   Refer to “DOOR MIRROR” in this section.

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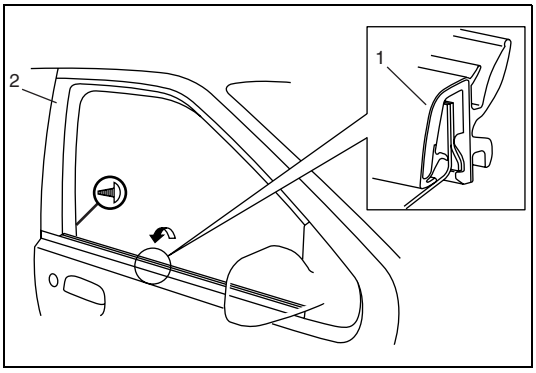
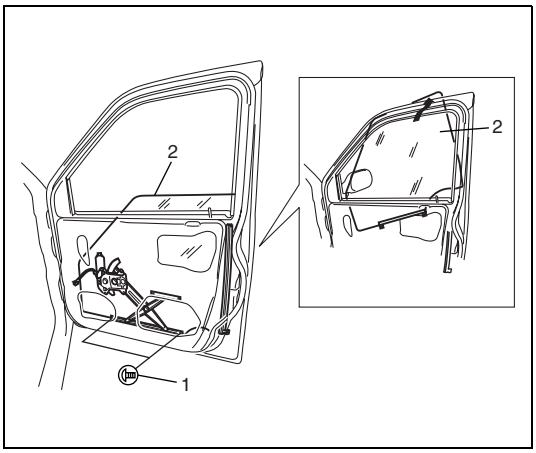


8) Remove outer weather-strip (1).
Lower window all the way down. Then, use a tape-wrapped putty knife to pry off outer weather-strip.

NOTE:

When removed outer weather-strip (1) from door panel (2), be careful not to deformation for outer weather-strip (1).

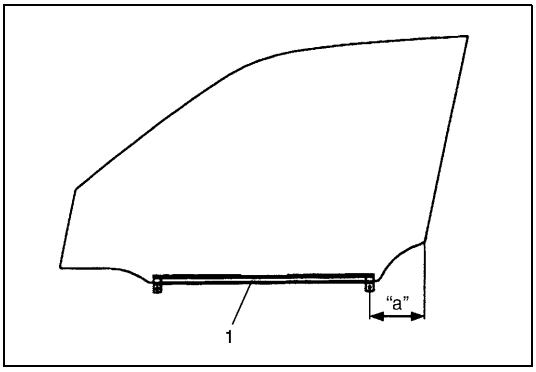


9) Remove bottom channel attaching screws (1).
10) When removing door glass (2), turn door glass 90° counter-clockwise to remove it.

INSTALLATION

Reverse removal procedure to install door glass noting the following instructions.

- If there is deformity for glass run, replace new one.
- Tighten bottom channel attaching screws. Tighten rear screw first, and then tighten front screw.



- Glass fitted position of bottom channel (1) is as shown in figure.

Glass fitted position of bottom channel "a"
3-door model : 335.5 - 338.5 mm (13.21 - 13.33 in.)
5-door model : 90.8 - 93.8 mm (3.57 - 3.69 in.)

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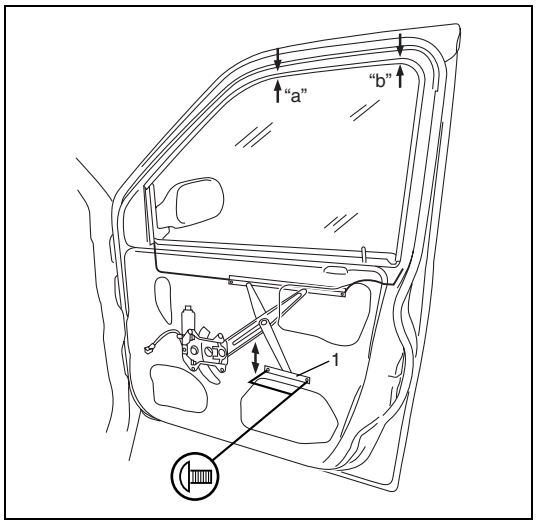
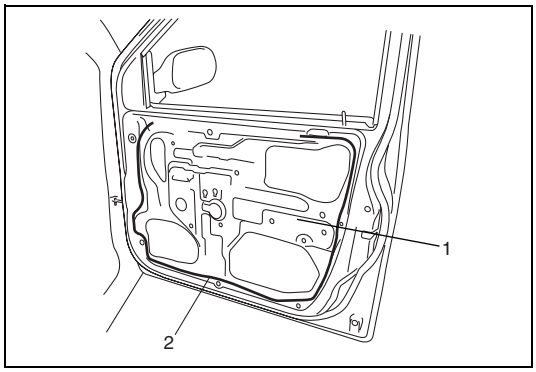
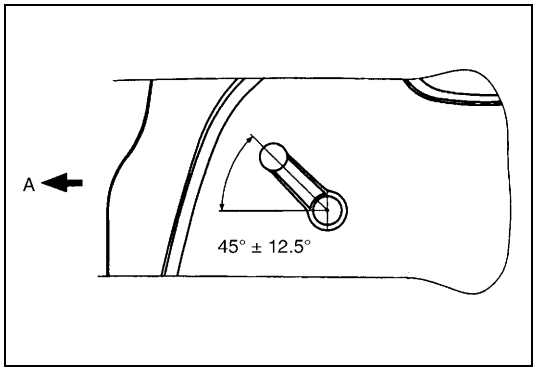


- Adjust equalizer (1) of window regular so that measurement "a" and "b" are equal.



- Secure door sealing cover (1) with adhesive (2).



- Install door window regulator handle (1) so that it has a 45° ±12.5° angle when glass is fully closed as shown in figure

A : Front

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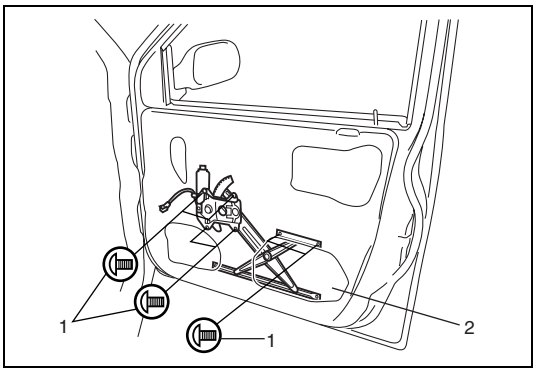
FRONT DOOR WINDOW REGULATOR

REMOVAL

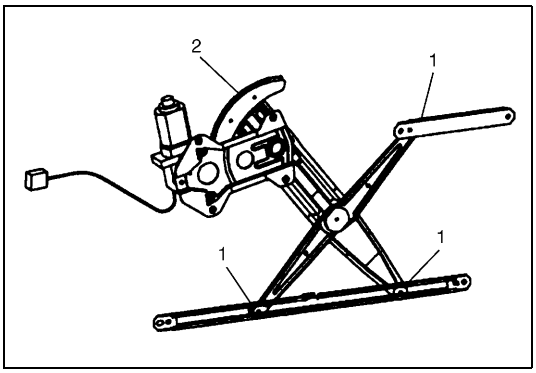
1) Remove door glass referring to “FRONT DOOR GLASS” in this section.
2) Disconnect power window motor lead wire at coupler and loosen clamp, if equipped.
3) Loosen regulator mounting screws (1) and take out regulator through hole (2) as shown in figure.



INSPECTION

Check the following parts :

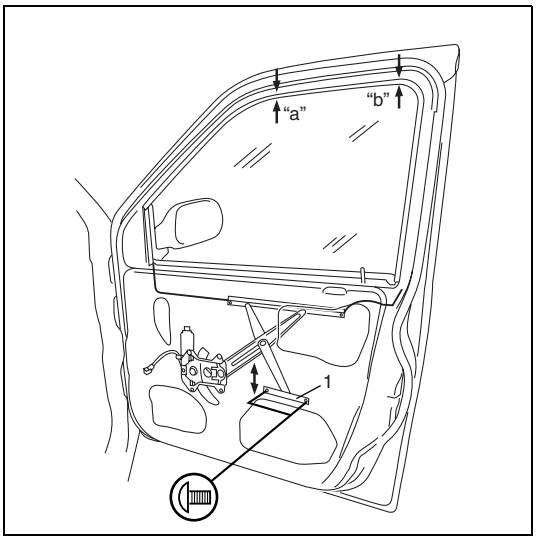
- Check regulator sliding and rotating parts for greasing (1).
- Check rollers (2) for wear and damage.



INSTALLATION

Reverse removal procedure to install window regulator noting the following instruction.

- When installing glass, check that the top part of the glass contacts the glass run evenly and that the glass moves up and down smoothly.
  If the glass is tilted with respect to the glass run, adjust equalizer (1) of window regulator so that measurement “a” and “b” are equal.



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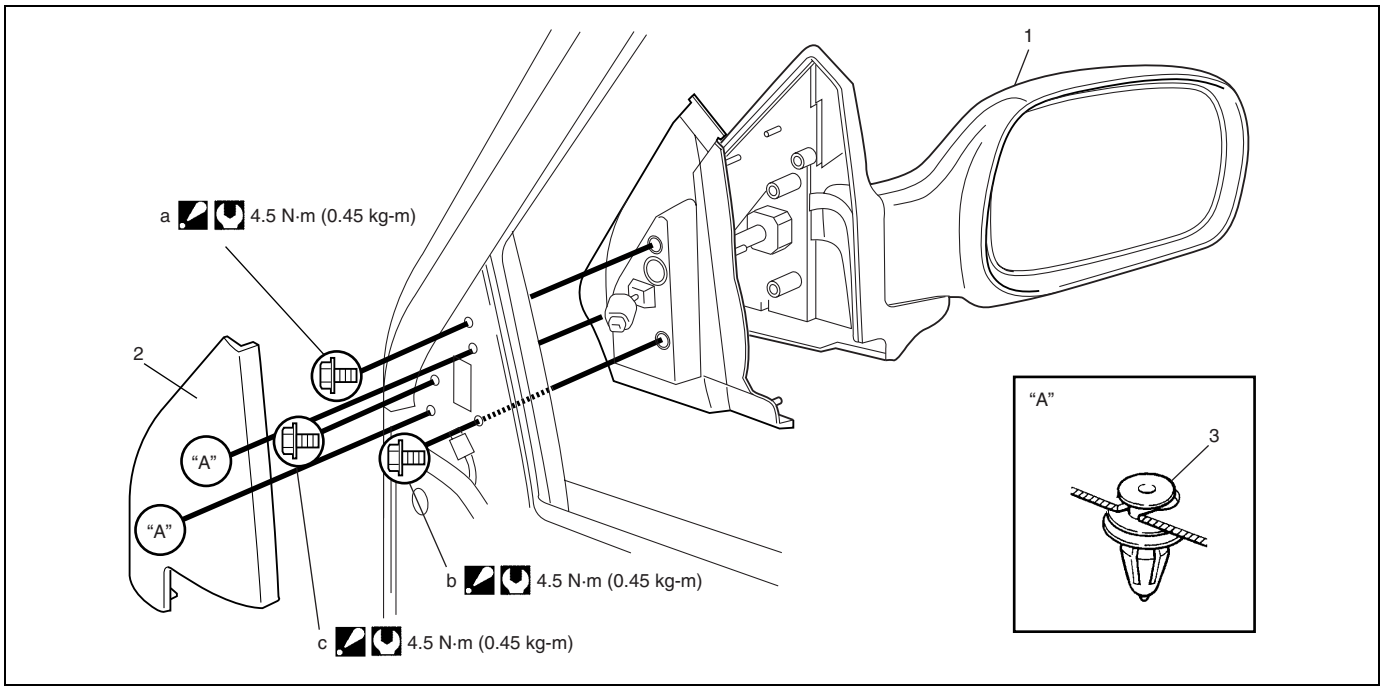
DOOR MIRROR



1. Door mirror	a. Mirror mount screw	Tightening order : a → b → c
2. Inner garnish	b. Mirror mount screw	Tightening torque
3. Clip	c. Mirror mount screw	

REMOVAL AND INSTALLATION

When removing or installing door mirror, refer to above figure.

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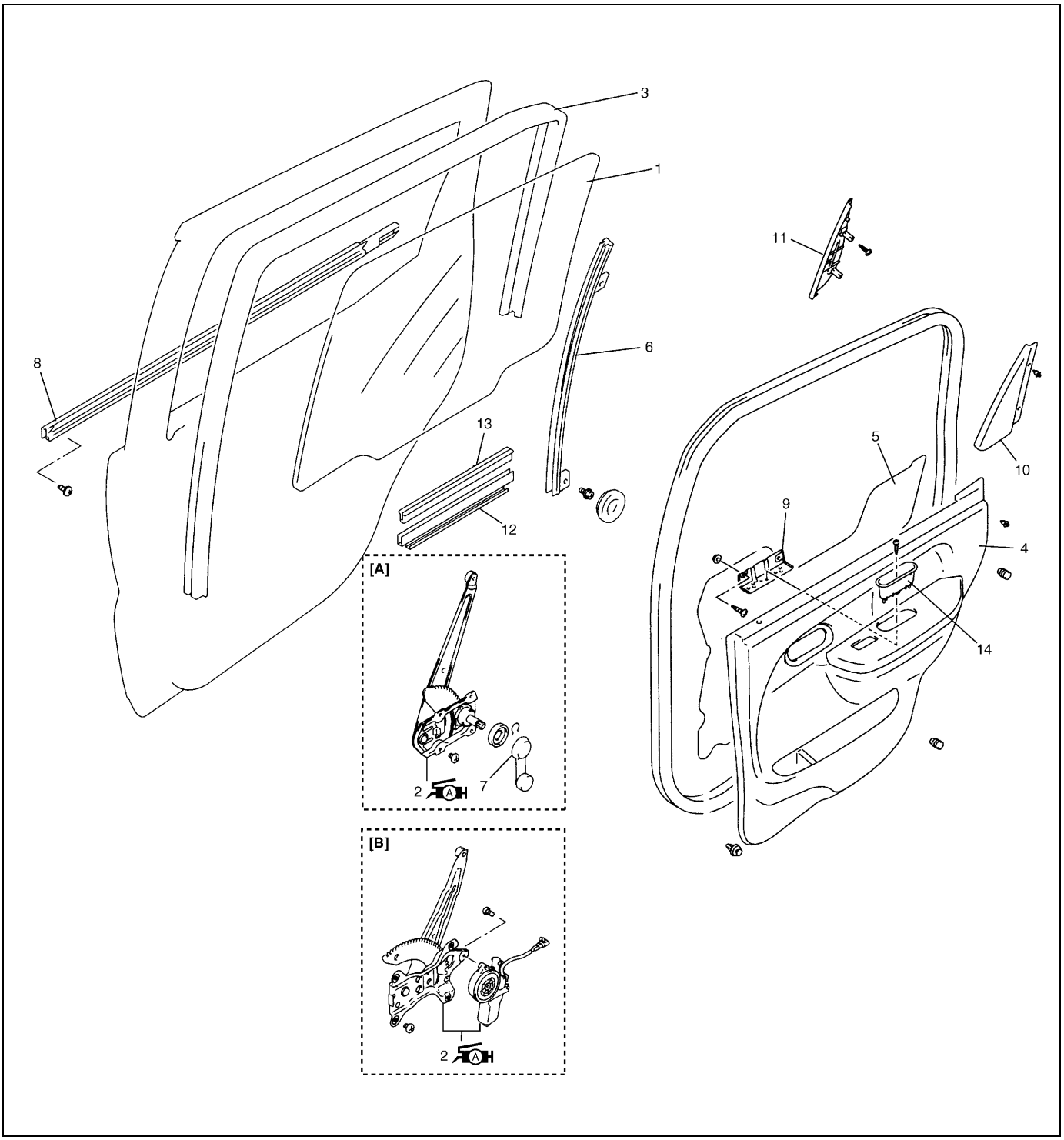
REAR DOOR GLASS (IF EQUIPPED)



	1. Door glass	7. Window regulator handle	13. Glass bottom rubber
A H	2. Window regulator assembly : Apply lithium grease 99000-25010 to moving section.	8. Rear door outer weather-strip	14. Door inside pull handle case
	3. Glass run	9. Rear door inside pull handle bracket	[A] : Without power window model
	4. Door trim	10. Rear door inner garnish	[B] : With power window model
	5. Door sealing cover	11. Rear door outer garnish	
	6. Door sash	12. Glass bottom channel	

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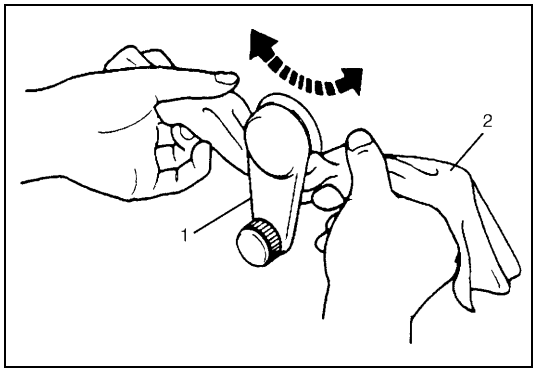
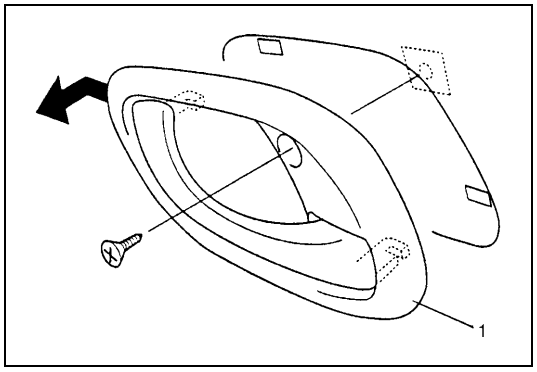
REMOVAL

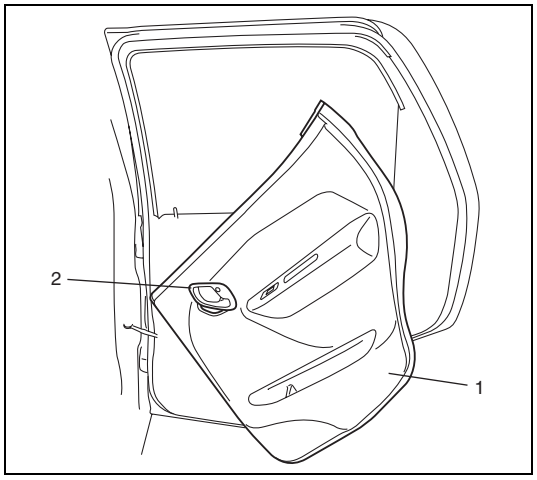


1) Remove window regulator handle (1) (if equipped).
   For its removal, pull off snap by using a cloth (2) as shown in figure.



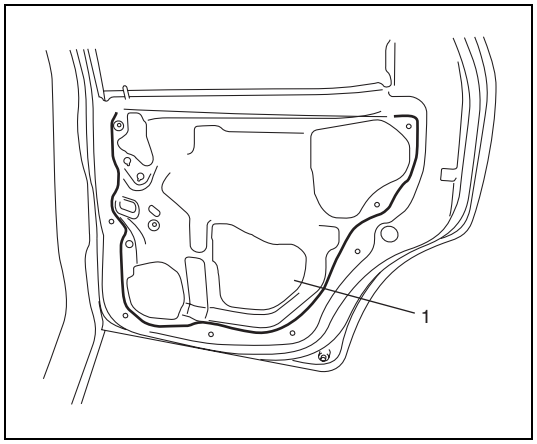
2) Remove inside handle bezel (1).

3) Remove door inside pull handle case fitting screw.
4) Remove rear door inner garnish.



5) Remove door trim (1).
   With inside handle bezel (2) tilted as shown in figure, turn door trim 90° counterclockwise to remove it.
   And disconnect power window switch lead wire at coupler (if equipped).

6) Remove door inside pull handle bracket.



7) Remove door sealing cover (1).

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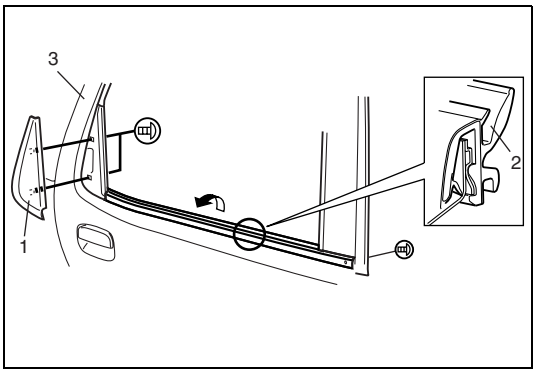
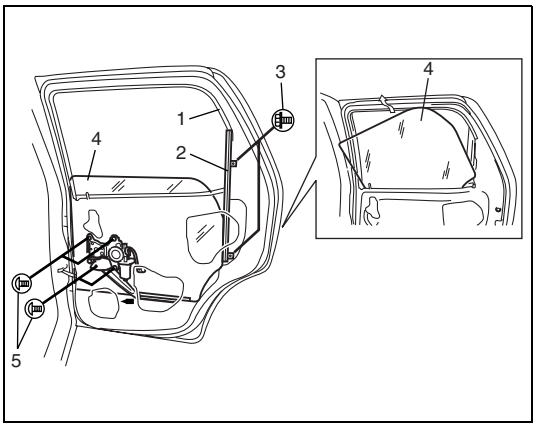


8) Remove rear door outer garnish (1).
9) Remove outer weather-strip (2).
   Lower window all the way down. Then, use a tape-wrapped putty knife (or screwdriver) to pry off outer weather-strip.

NOTE:

When removed outer weather-strip (2) from door panel (3), be careful not to deformation for outer weather-strip (2).

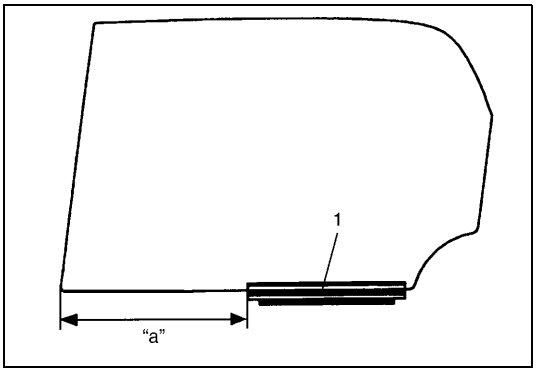


10) Detach rear part of glass run (1) from sash (2) and remove sash (2) by removing 2 screws (3).
11) Loosen window regulator mounting screws (5).
12) When removing door glass (4), turn door glass 90° counterclockwise to remove it.

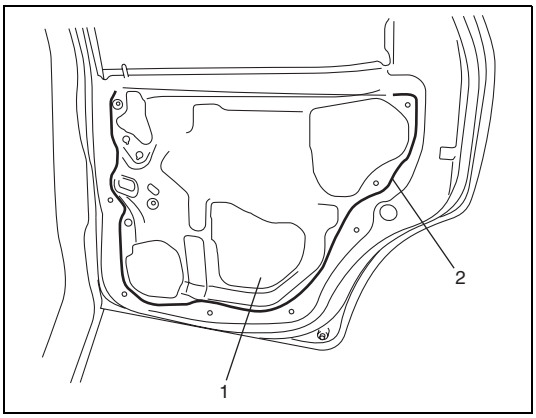
INSTALLATION

Reverse removal procedure to install door glass noting the following instructions.

- If there is deformity for glass run, replace new one.
- Tighten bottom channel attaching screws. Tighten rear screw first, and then tighten front screw.
- Glass fitted position of bottom channel (1) is as shown in figure.



Glass fitted position of bottom channel
"a" : 201.9 - 204.9 mm (7.95 - 8.07 in.)



- Secure door sealing cover (1) with adhesive (2).

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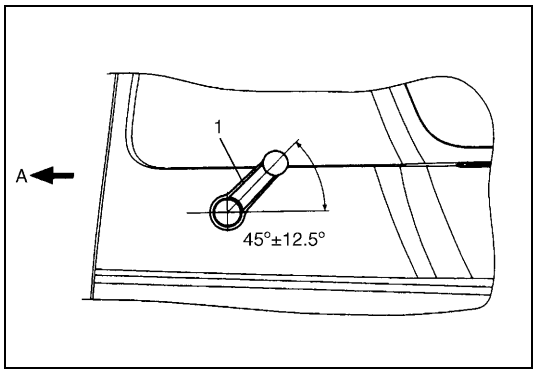
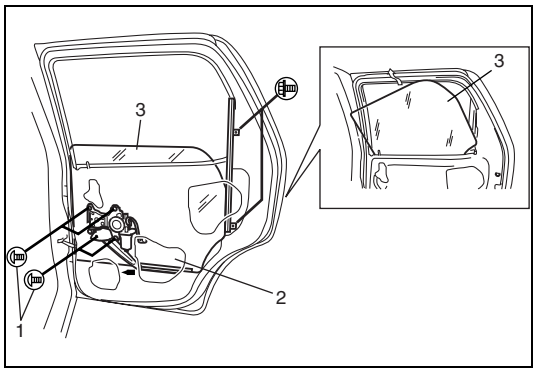


- Install door window regulator handle (1) so that it has a 45° ±12.5° angle when glass is fully closed.

A : Front

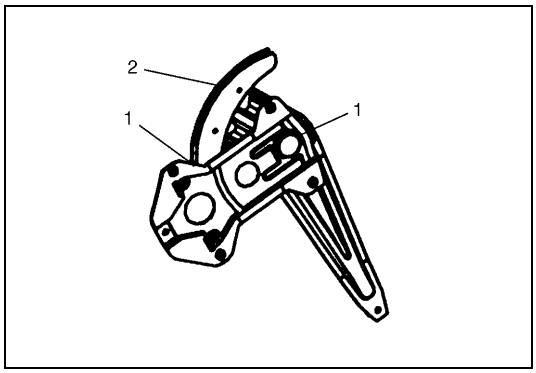
REAR DOOR WINDOW REGULATOR

REMOVAL



1) Remove door glass (3) referring to “REAR DOOR GLASS” in this section.
2) Loosen regulator mounting screws (1) and take out regulator through hole (2) as shown.

INSPECTION

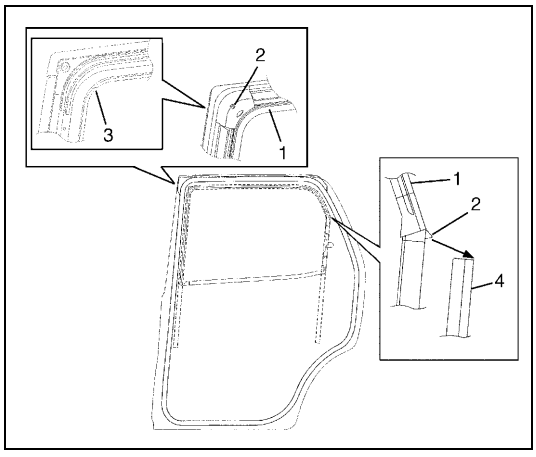


Check the following point :

- Check regulator sliding and rotating parts for greasing (1).
- Check rollers (2) for wear and damage.

INSTALLATION

Reverse removal procedure to install window regulator noting the following instruction.



- When glass run (1) is installed, fit glass run convex part (2) to door panel cut part (3) and door sash (4).

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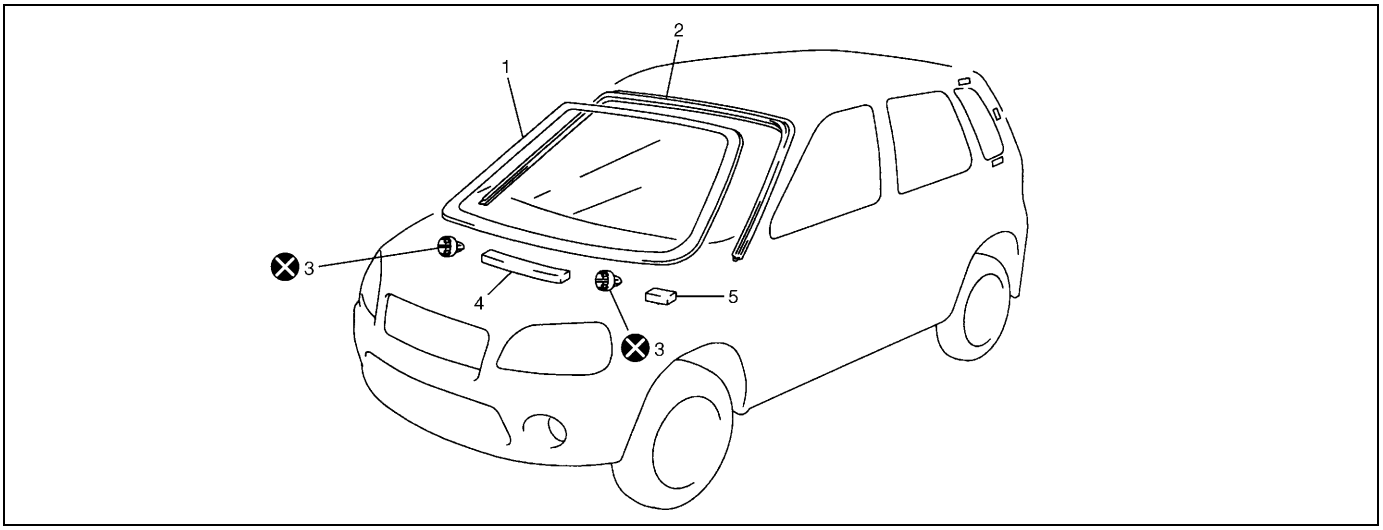
WINDOW SHIELD

The front windshield is installed by using a special type of adhesive (that is, one component urethane adhesive used with primer). For the Windshield replacement, it is important to use an adhesive which provides sufficient adhesion strength and follow the proper procedure.



1. Windshield glass	3. Stopper	5. Side spacer
2. Windshield molding	4. Center spacer	⊗ Do not reuse.

CAUTION:

- **Described in this section is the glass replacement by using 3 types of primers and 1 type of adhesive made by YOKOHAMA (one component urethane adhesive to be used with primer in combination). When using primer and adhesive made by other manufacturers, be sure to refer to handling instructions supplied with them. Negligence in following such procedure or misuse of the adhesive in any way hinders its inherent adhesive property. Therefore, before the work, make sure to read carefully the instruction and description given by the maker of the adhesive to be used and be sure to follow the procedure and observe each precaution throughout the work.**
- **Should coated surface be scratched or otherwise damaged, be sure to repair damaged part, or corrosion may start from there.**

Use an adhesive of above mentioned type which has the following property.

Glass adhesive shearing strength

: 40 kg / cm^2 (569 lb / in^2) or more

Adhesive materials and tools required for removal and installation.

- One component urethane adhesive and primers used in combination (For one sheet of windshield).
  - Adhesive (470 g (15.7 oz.))
  - Primer for glass (30 g (1.0 oz.))
  - Primer for body (30 g (1.0 oz.))
  - Primer for molding (30 g (1.0 oz.))
- Eyeleteer
- Piano string
- Windshield knife
- Brush for primer application (2 pcs)
- Knife
- Rubber sucker grip
- Sealant gun (for filling adhesive)
- Putty spatula (for correcting adhered parts)

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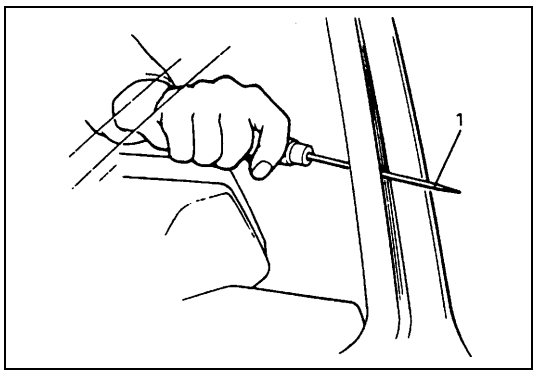
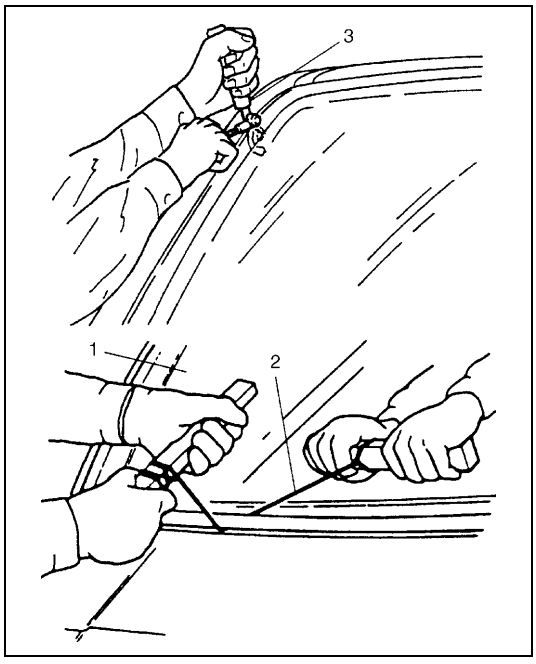
REMOVAL

1) Clean both inside and outside of glass and around it.
2) Remove wiper arms and garnish.
3) Using tape, cover body surface around glass to prevent any damage.
4) Remove rear view mirror, sunvisor, and front pillar trims (right & left).
5) If necessary, remove instrument panel. Refer to “INSTRUMENT PANEL” in this section.
6) If necessary, remove head lining. Refer to “HEAD LINING” in this section.
7) Remove (or cut) windshield molding.



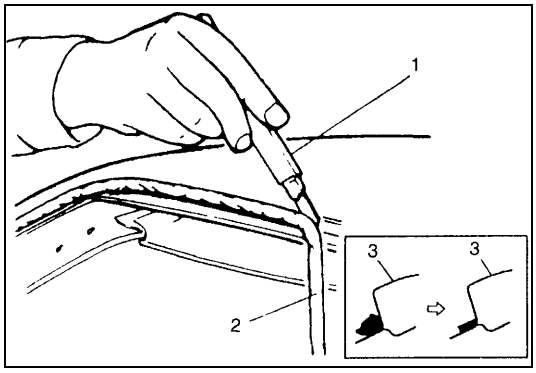
8) Drill hole with eyeleteer (1) through adhesive and let piano string through it.



9) Cut adhesive all around windshield (1) with piano string (2). When using tool, windshield knife (3), to cut adhesive, be careful not to cause damage to windshield. Use wire to cut adhesive along lower part of windshield.

NOTE:

Use piano string (2) as close to glass as possible so as to prevent damage to body and instrument panel.



10) Using knife (1), smoothen adhesive (2) remaining on body side (3) so that it is 1 to 2 mm thick all around.

NOTE:

Before using knife (1), clean it with alcohol or the like to remove oil from it.

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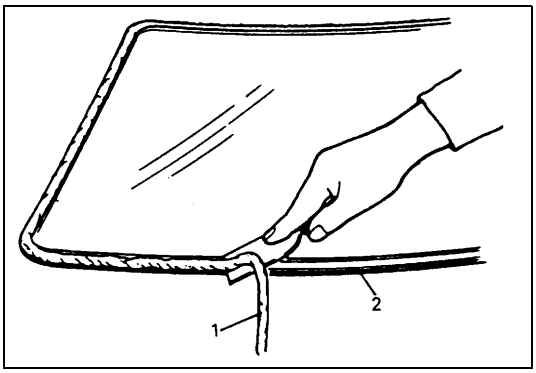
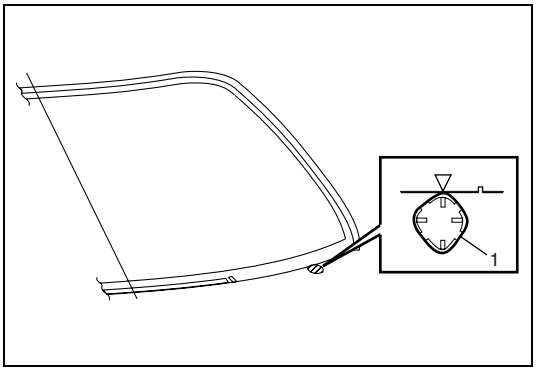


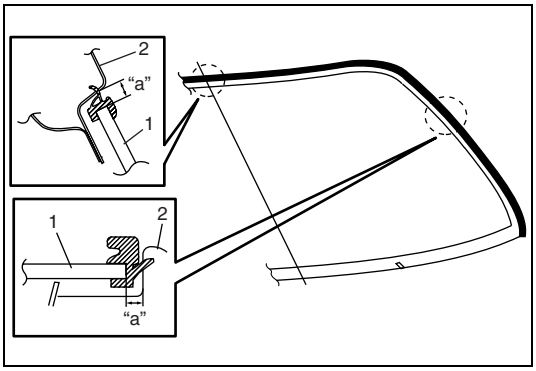
11) When reusing windshield, remove the adhesive (1) from it, using care not to damage primer coated surface (2).

INSTALLATION

1) Using cleaning solvent, clean windshield edge where windshield glass is to be adhered. (Let it dry for more than 10 minutes.)

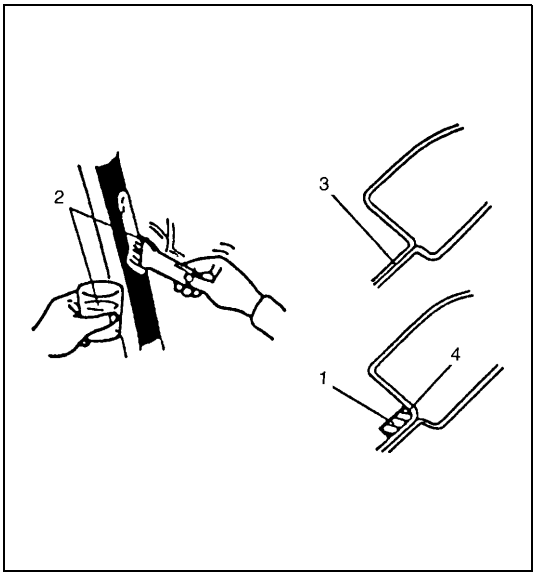


2) Install new glass stoppers (1) (2 pieces) to lower side of windshield.



3) To determine installing position of glass (1) to body (2), position glass against body so that clearance between upper end of glass (1) and body (2) is approximately 5 mm (0.197 in.) and clearances between each side end (right & left) of glass (1) and body (2) are even. Then mark mating marks on glass (1) and body (2) as shown. Upper clearance can be adjusted by moving glass stoppers position.

Windshield clearance
"a" : 5 mm (0.197 in.)



4) Clean contact surfaces of old adhesive (4), paint or bare metal thoroughly.
If surfaces of paint or bare metal come out, apply primer (2) for body with caution not to apply primer (2) to surface of adhesive remaining on body.

NOTE:

- **Be sure to refer to primer maker's instruction for proper handling and drying time.**
- **Do not touch body and old adhesive surfaces where glass is to be adhered.**

1.	Do not apply primer
3.	Apply primer

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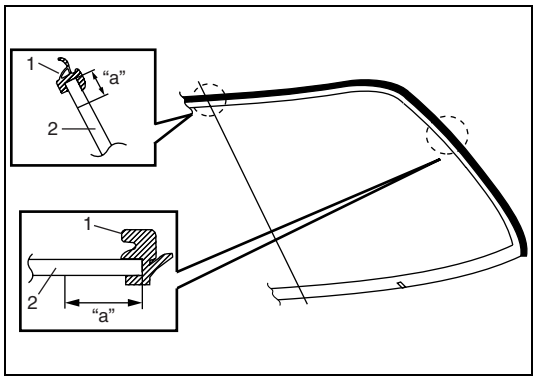
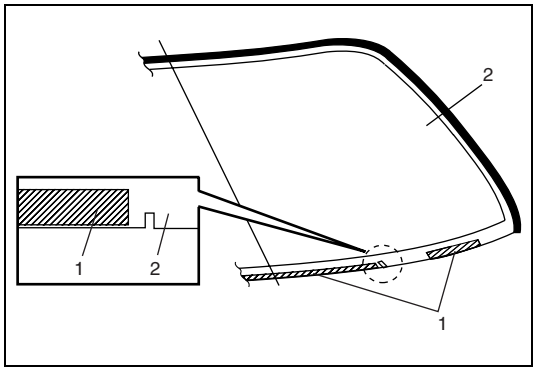
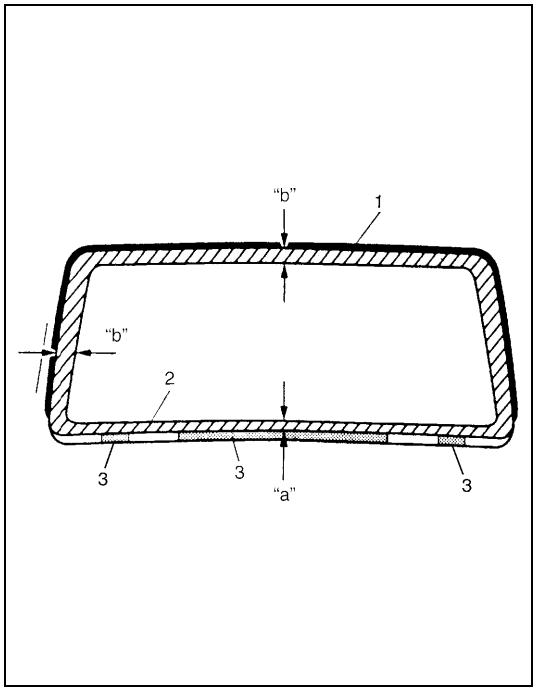


5) Install new molding (1) to glass (2).
6) Clean glass surface to be adhered to body with clean cloth. If cleaning solvent is used, let it dry for more than 10 minutes.

Cleaning Area for windshield (distance from the edge of glass or molding)
"a" : 30 - 50 mm (1.18 - 1.97 in.)



7) Install new spacer (1) to glass (2).



8) Using new brush, apply sufficient amount of primer for glass along glass surface to be adhered to body.

NOTE:

- **Be sure to refer to maker's instruction for proper handling and drying time.**
- **Do not apply primer on outside of ceramic coated surface.**
- **Do not touch primer coated surface.**

Width applied primer for windshield
"a" : 22 mm (0.87 in.)
"b" : 15 mm (0.59 in.)

1.	Molding
2.	Fastener
3.	Spacer

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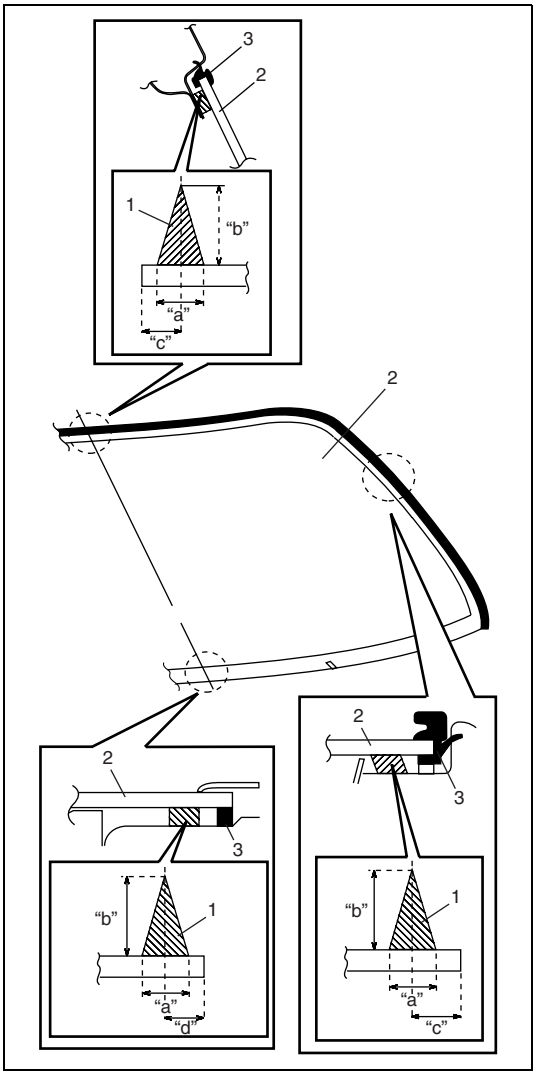


9) Apply primer for molding along molding surface all around.

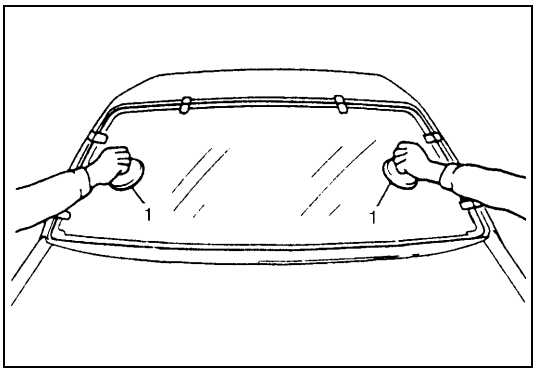
10) Apply adhesive (1) referring to figure.

NOTE:

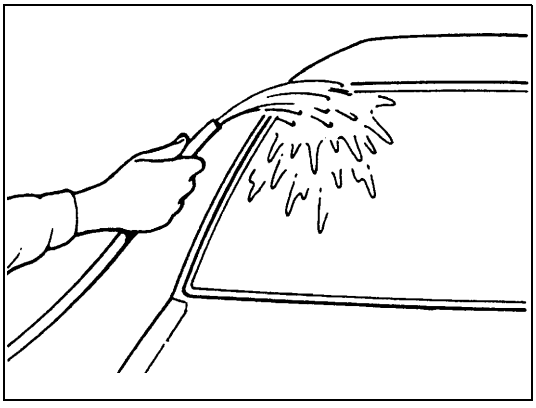
- **Press glass (2) against fittings surface of body panel quickly after adhesive (1) is applied.**
- **Use of rubber sucker grip is helpful to hold and carry glass after adhesive (1) is applied.**
- **Perform steps 8) to 9) within 10 min. to ensure sufficient adhesion.**
- **Be sure to refer to adhesive maker's instruction for proper handling and drying time.**
- **Start from bottom side of glass (2).**
- **Be careful not to damage primer.**

Adhesive amount specifications and position for windshield
Width "a" : Approx. 7 mm (0.27 in.)
Height "b" : Approx. 15 mm (0.59 in.)
Position "c" : Approx. 10 mm (0.39 in.) for front, rear and upper sections
Position "d" : Approx. 17 mm (0.67 in.) for bottom section.

3. Molding



11) Holding rubber sucker grips (1), place glass onto body by aligning mating marks marked in step 3) and press it.



12) Check for water leakage by pouring water over windshield through hose. If leakage is found, dry windshield and fill leaky point with adhesive. If water still leaks even after that, remove glass and start installation procedure all over again.

NOTE:

- **Do not use high pressure water.**
- **Do not blow compressed air directly at adhesive applied part when drying.**
- **Do not use infrared lamp or like for drying.**

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CAUTION:

Upon completion of installation, note the following.

- **Sudden closing of door before adhesive is completely set may cause glass to become loose or to come off. Therefore, if door is opened or closed before adhesive is completely set, make sure to open all door glasses and use proper care.**
- **If molding is not securely in place, hold it down with a tape until adhesive is completely set.**
- **Each adhesive has its own setting time.**
- **Be sure to refer to its maker's instruction, check setting time of adhesive to be used and observe precautions to be taken before adhesive is set.**
- **Refrain from driving till adhesive is completely set so as to ensure proper and sufficient adhesion.**

QUARTER WINDOW

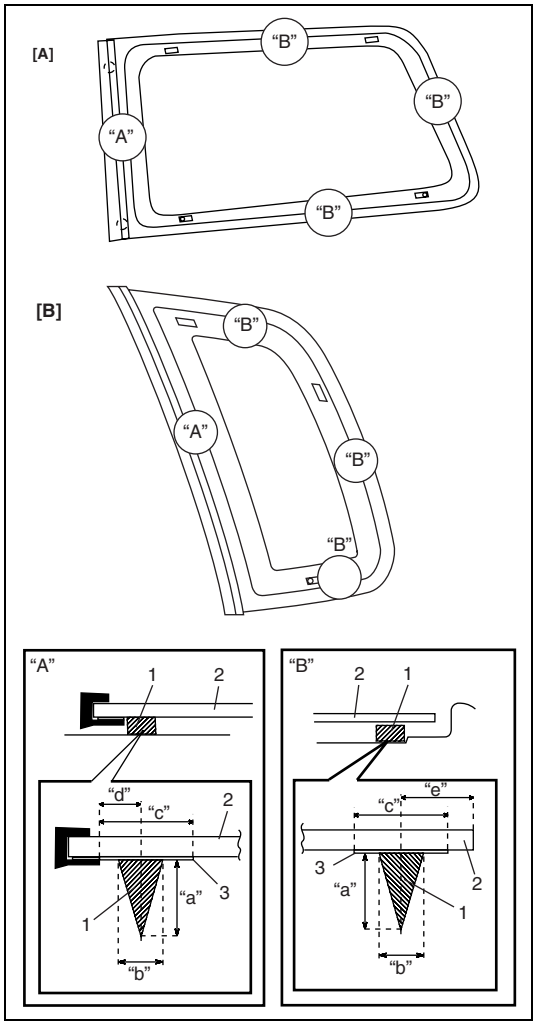
REMOVAL AND INSTALLATION

Refer to "WINDSHIELD" in this section as removal and installation procedures are basically the same. However, note the following.

- Observe the following precautions when applying adhesive (1) along glass (2) edge.
- Adhesive (1) should be applied evenly especially in height.
- Be careful not to damage primer (3).
- Press glass against body quickly after adhesive (1) is applied.

Adhesive amount specification and position for quarter window
Height "a" : 13 mm (0.51 in.)
Width "b" : 6 mm (0.24 in.)
Width "c" : 14 mm (0.55 in.)
Position "d" : 5 mm (0.20 in.) for glass front section.
Position "e" : 11 mm (0.43 in.) for glass rear and upper sections
Position "e" : 8 mm (0.31 in.) for 3 door model glass bottom section
Position "e" : 10 mm (0.39 in.) for 5 door model glass bottom section

[A] : 3-door model
[B] : 5-door model



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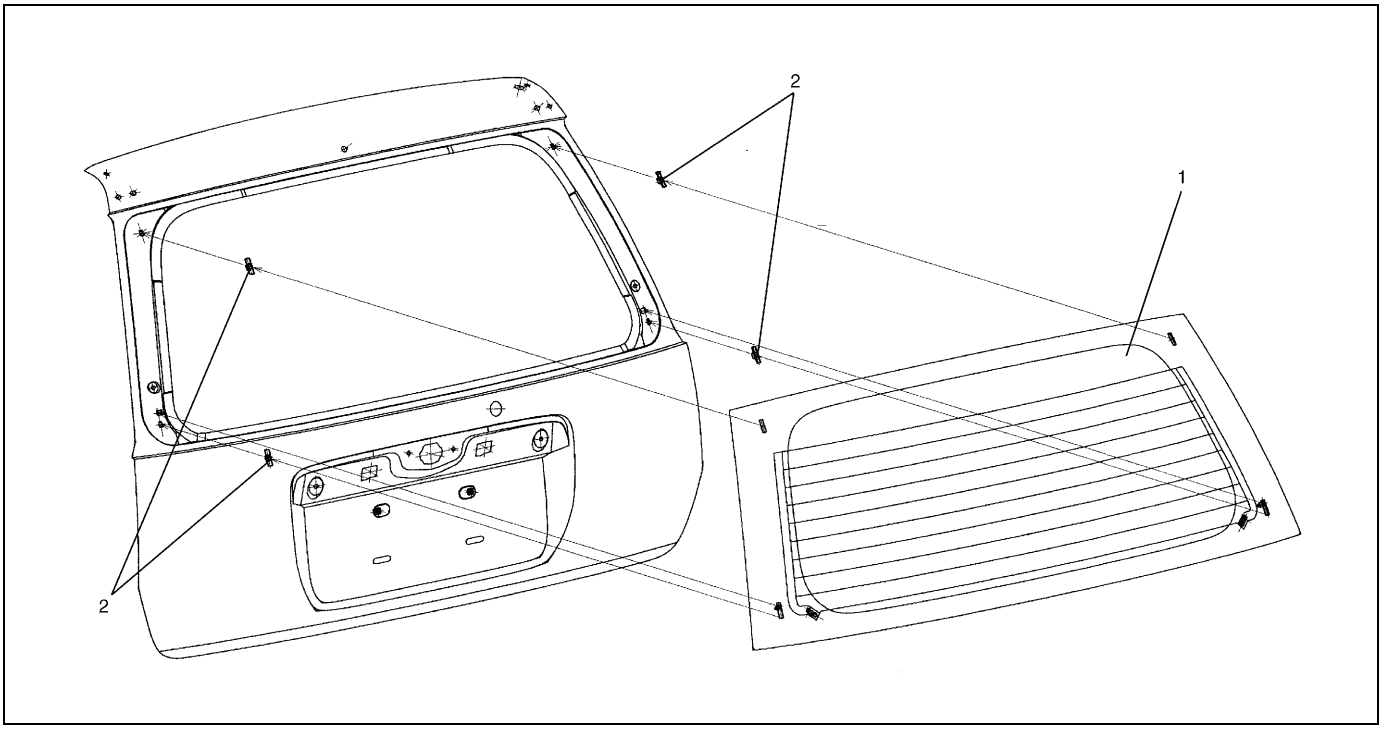
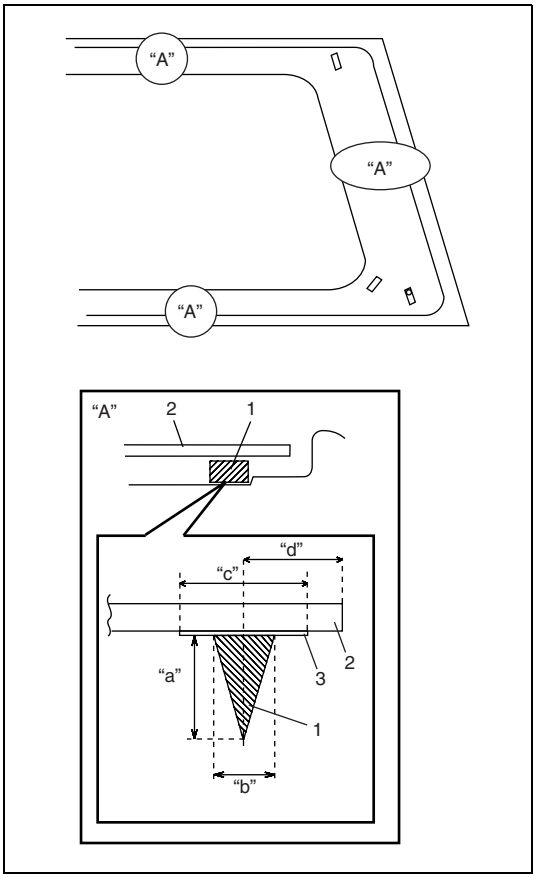
BACK DOOR GLASS



1. Back door glass	2. Fastener

REMOVAL AND INSTALLATION

Refer to “WINDSHIELD” in this section as removal and installation procedures are basically the same. However, note the following.



- Observe the following precautions when applying adhesive (1) along glass (2) edge.
- Adhesive (1) should be applied evenly especially in height.
- Be careful not to damage primer (3).
- Press glass against body quickly after adhesive (1) is applied.

Adhesive amount specifications and position for back door glass
Height “a” : 13 mm (0.51 in.)
Width “b” : 6 mm (0.24 in.)
Width “c” : 14 mm (0.55 in.)
Position “d” : 14.5 mm (0.57 in.) for glass upper section
Position “d” : 16 mm (0.63 in.) for glass bottom section
Position “d” : 32 mm (1.26 in.) for glass side sections

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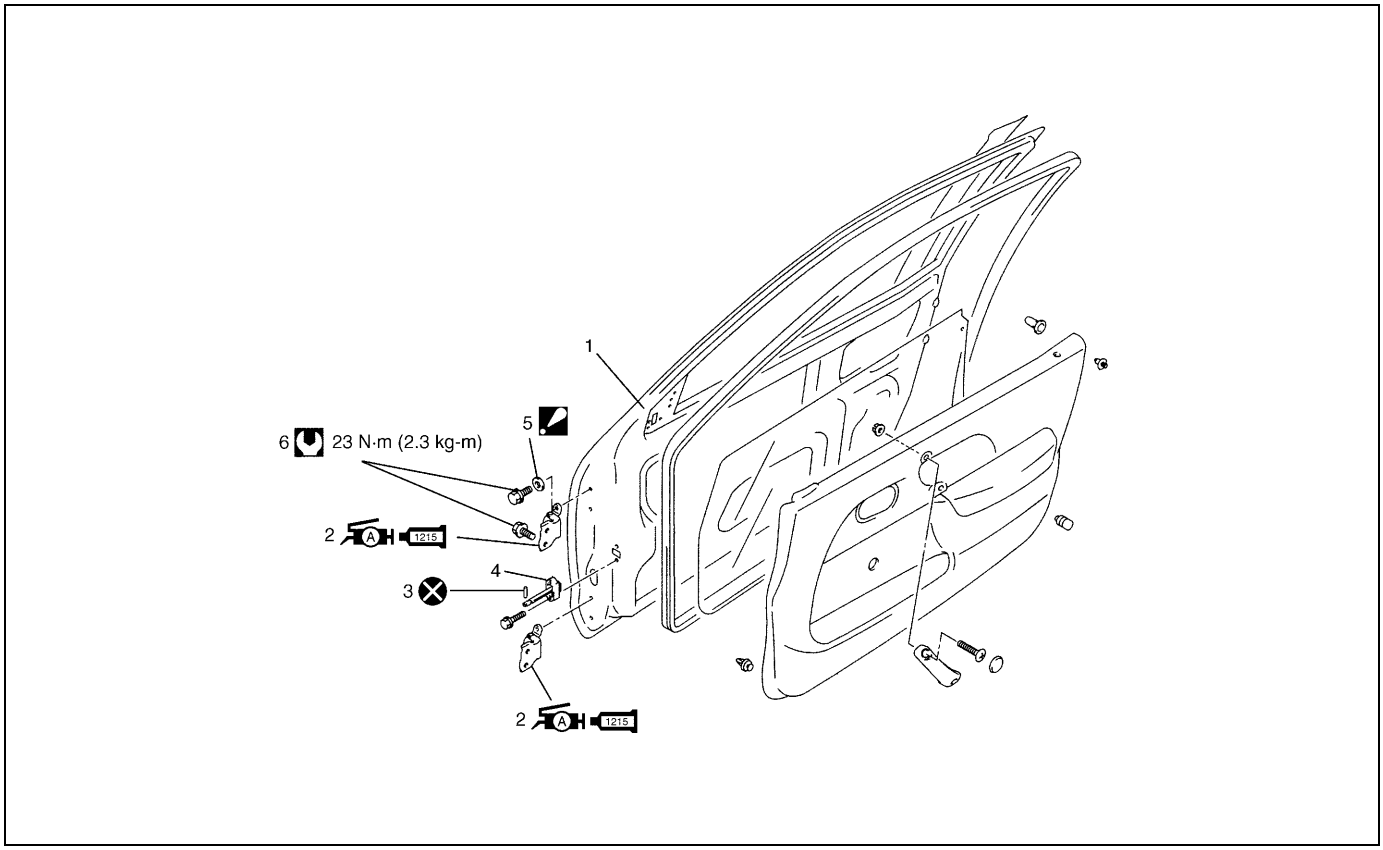
BODY STRUCTURE

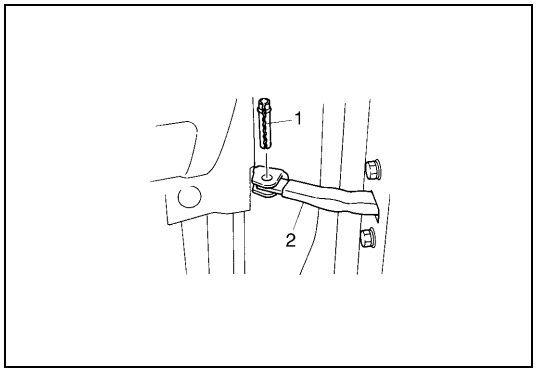
FRONT DOOR ASSEMBLY



	1. Door panel		5. Door hinge washer : Not necessary to install
A 1215	2. Door hinge : Apply lithium grease 99000-25010 to rotating part : Apply sealant 99000-31110 to contact face		6. Front door hinge bolt
	3. Door stopper pin		Tightening torque
	4. Door open stopper		Do not reuse.

REMOVAL

1) Remove front fender.
2) Disconnect door harness lead wires at each coupler, if equipped.
3) Remove stopper pin (1) from door open stopper (2).



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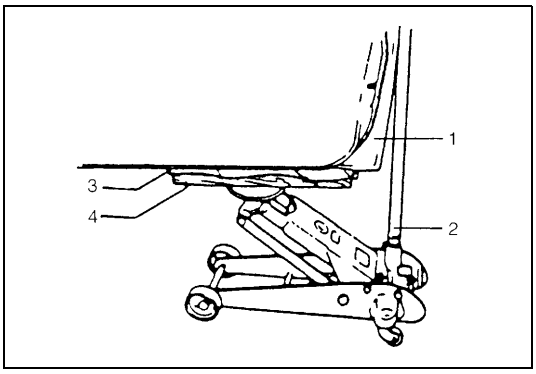
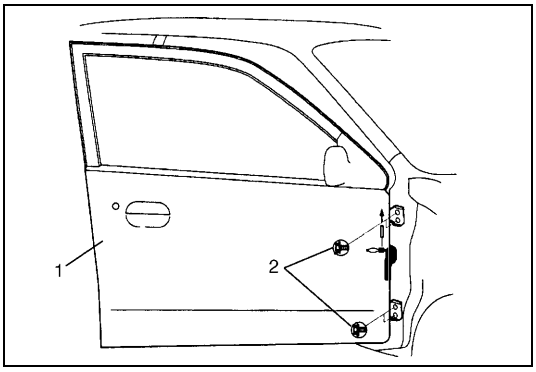


4) Support door panel (1) using a jack (2) with a piece of wood placed (4) between jack (2) and panel (1) as shown.

3. Rags

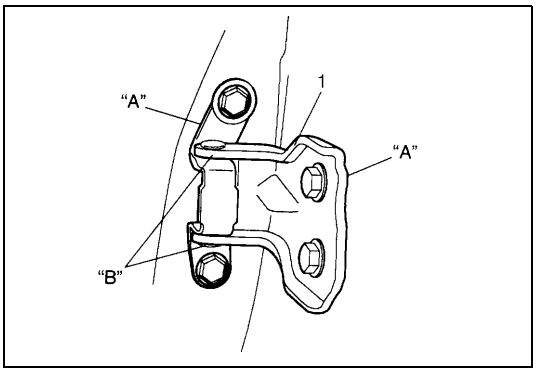


5) Remove door assembly (1) by loosening hinge mounting bolts (2).

INSTALLATION

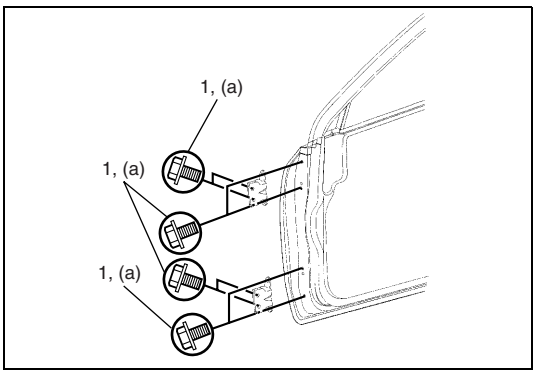
Reverse removal procedure to install door assembly noting the following instructions.

- When replacing door, coat replacement door inside with wax for proper anti-corrosion treatment.
  Refer to “ANTI-CORROSION COMPOUND APPLICATION AREA” in this section.



- Apply sealant to contact face “A” of hinge (1) and apply grease to rotating part “B” of hinge (1).

“A” : Sealant 99000-31110
“B” : Lithium grease 99000-25010



- Tighten hinge bolt (1) to specified torque.

Tightening torque
Door hinge mounting bolt
(a) : 23 N·m (2.3 kg-m, 17.0 lb-ft)

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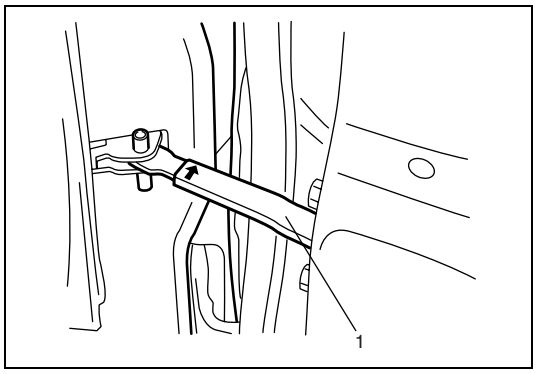

- When door open stopper (1) is installed, be careful to install direction as shown.

- Adjust door latch striker position referring to “FRONT DOOR LOCK ASSEMBLY” in this section.
- Adjust front door cushion so that door becomes flush with side body.
- After installation, open and close the door to check looseness.
  Replace door open stopper pin when there is looseness.
- When weather-strip is hardened, water leak may develop.
  In such case, replace it with new one.

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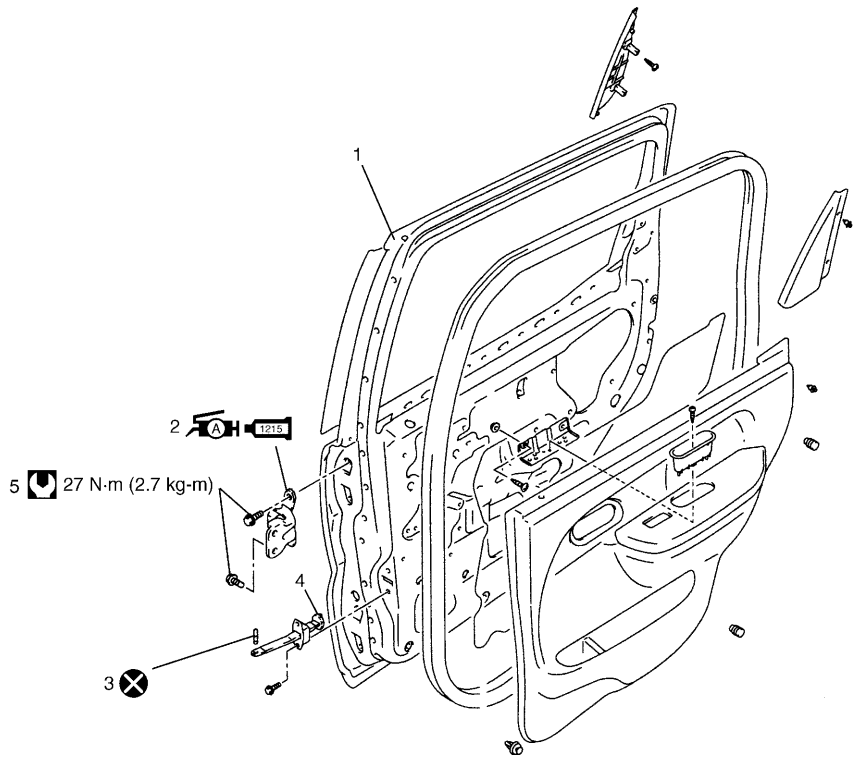
REAR DOOR ASSEMBLY



	1. Door panel	4. Door stopper	Do not reuse.
1215	2. Door hinge : Apply lithium grease 99000-25010 to rotating part : Apply sealant 99000-31110 to contact face	5. Rear door hinge bolt	
	3. Door stopper pin	Tightening torque	

REMOVAL AND INSTALLATION

Refer to “FRONT DOOR ASSEMBLY” in this section noting the following instructions.

- Refer to above figure for tightening torque, grease and sealant.
- When door open stopper is installed, be careful to face side.

Door stopper installing direction
Right side door : RR punch mark is upward.
Left side door : RL punch mark is upward.

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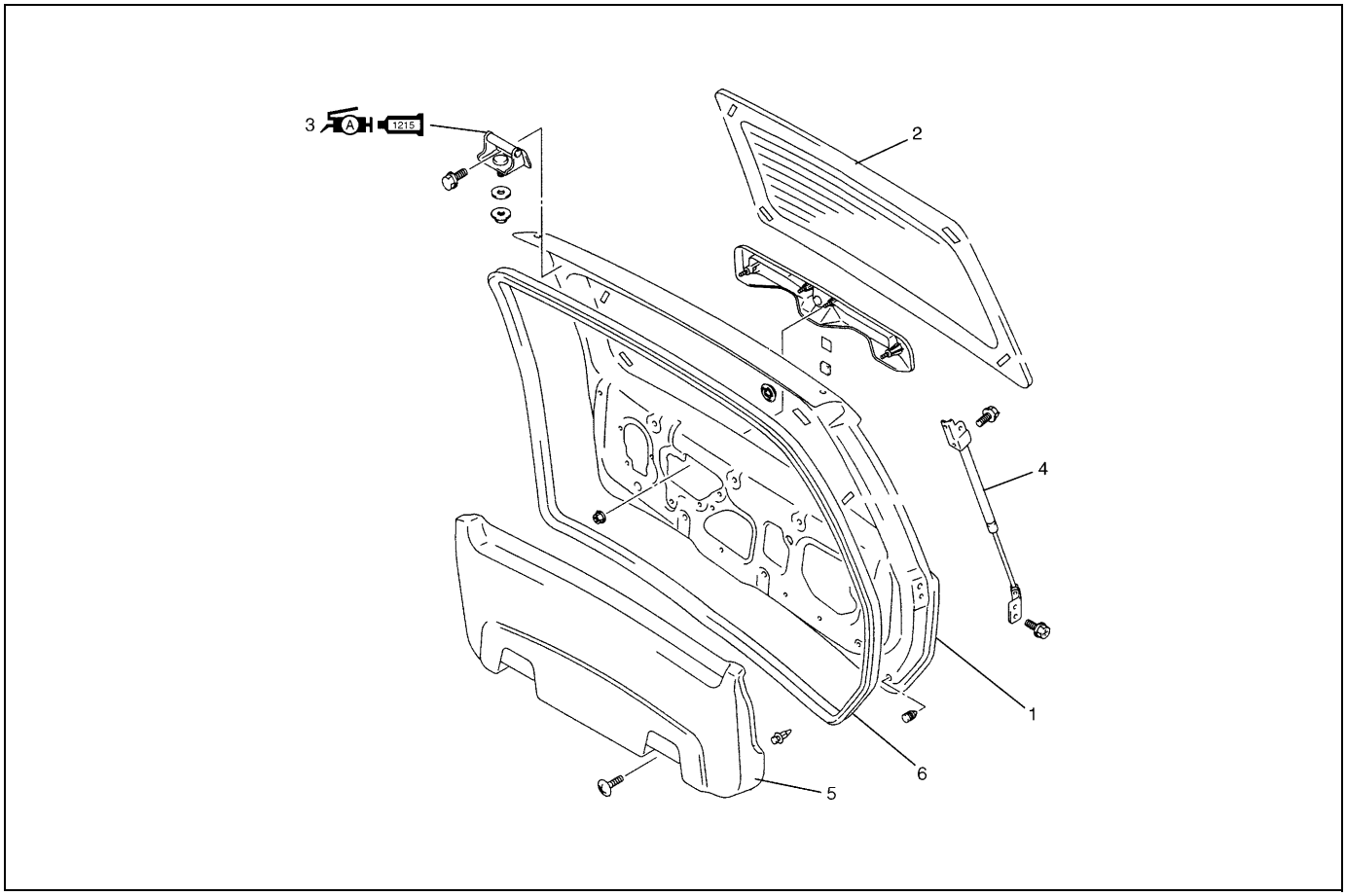
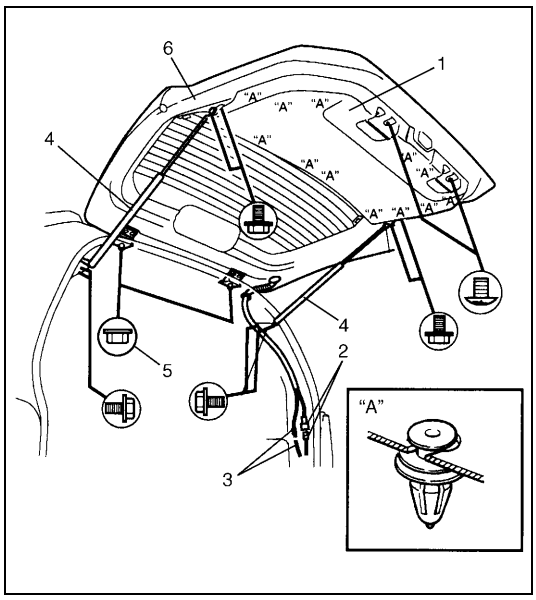
BACK DOOR ASSEMBLY



	1. Back door panel assembly	4. Back door balancer unit
	2. Back door window glass	5. Back door trim
A 1215	3. Back door hinge : Apply lithium grease 99000-25010 to door hinge moving section : Apply sealant 99000-31110 to contact face	6. Weather strip

REMOVAL



1) Remove back door trim (1).
2) Remove related section of head lining and quarter trim.
3) Disconnect back door harness connectors (2) and washer hose (3).
4) Remove wire harness connectors inside back door.
5) Remove back door balancer (4) (first at its door side and next at its body side).
6) Remove door hinge nuts (5) and remove back door assembly (6).

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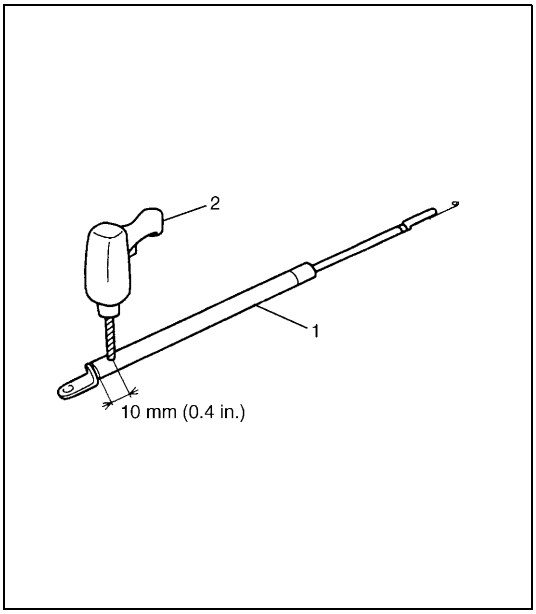


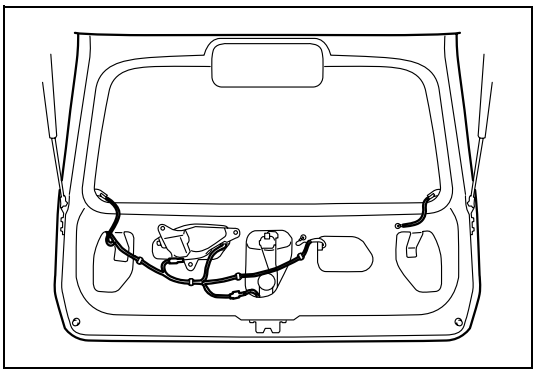
WARNING:

Handling of Back Door Balancer (Damper)

- **Do not disassemble balancer (1) because its cylinder is filled with gas.**
- **Handle balancer carefully. Do not scar or scratch exposed surface of its piston rod, and never allow any paint or oil to stick to its surface.**
- **Do not turn piston rod with balancer fully extended.**
- **When discarding removed back door balancer (damper), use a 2 – 3 mm (0.08 – 0.12 in.) drill (2) to make a hole as shown.**
- **The gas itself is harmless but it may issue out of the hole together with chips generated by the drill (2). Therefore, be sure to wear goggle.**

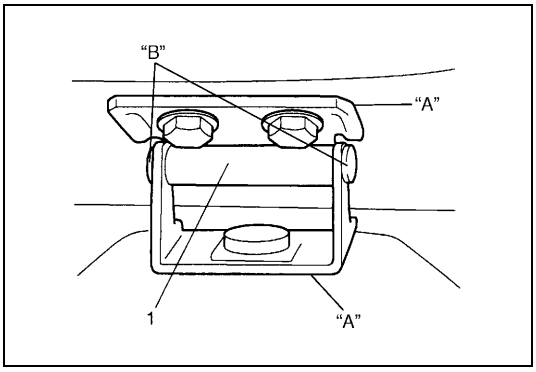
INSTALLATION

Reverse removal procedure to install back door noting the following instructions.



- Secure wiring harness.

- Adjust door latch striker position by referring “BACK DOOR LOCK ASSEMBLY” in this section.
- Adjust door cushion so that door contacts body when closed.
- Adjust door clearance by loosening door hinge mounting bolts and nuts referring to “PANEL CLEARANCE” in this section.



- Apply sealant to contact face “A” of door hinge (1) and apply grease to rotating part “B” of hinge (1).

“A” : Sealant 99000-31110
“B” : Lithium grease 99000-25010

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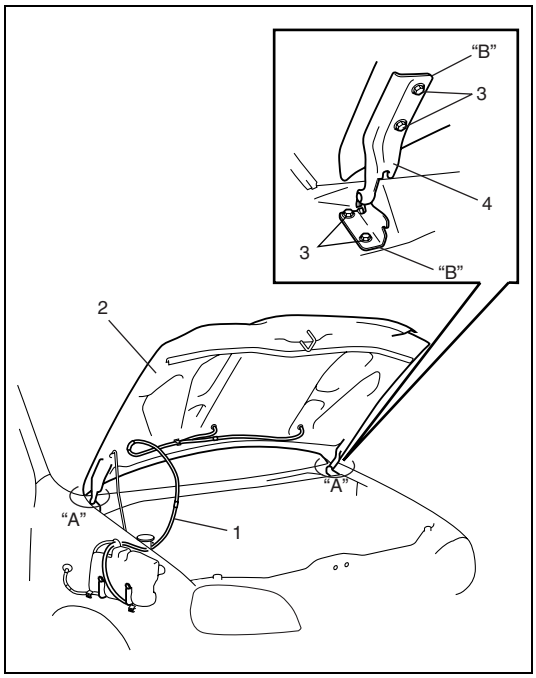
HOOD

REMOVAL



CAUTION:
Place cloth on "A" in figure to prevent from any damage.

1) Remove window washer hose (1) from hood (2).
2) Remove 4 mounting bolts (3) to detach hood (2).

INSTALLATION

Reverse removal procedure to install hood noting the following instruction.

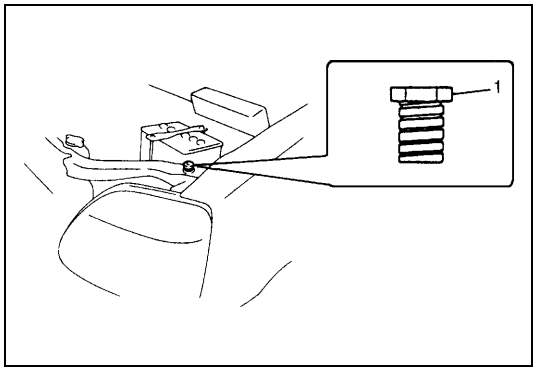
- Apply sealant to contact face "B" of hood hinge (4).

"B" : Sealant 99000-3110

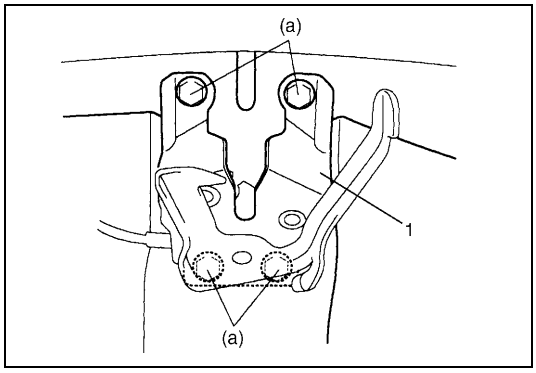
ADJUSTMENT

Adjust the following point :

- Hood position adjustment.
  Fore-and-aft and right-and-left adjustment.
  Adjust hood clearance by loosening hood mounting bolts, refer to "PANEL CLEARANCE" in this section.



- Vertical adjustment
  If only one side (right or left) of hood is not level with front fender, make it level by tightening or loosening hood cushion (1).



- Hood lock position adjustment
  When installing hood lock (1), bring bolt at highest position and move it in vertical direction for adjustment free from loose to hood striker.

Tightening torque
Hood latch bolts (a) : 10 N·m (1.0 kg-m, 7.0 lb-ft)

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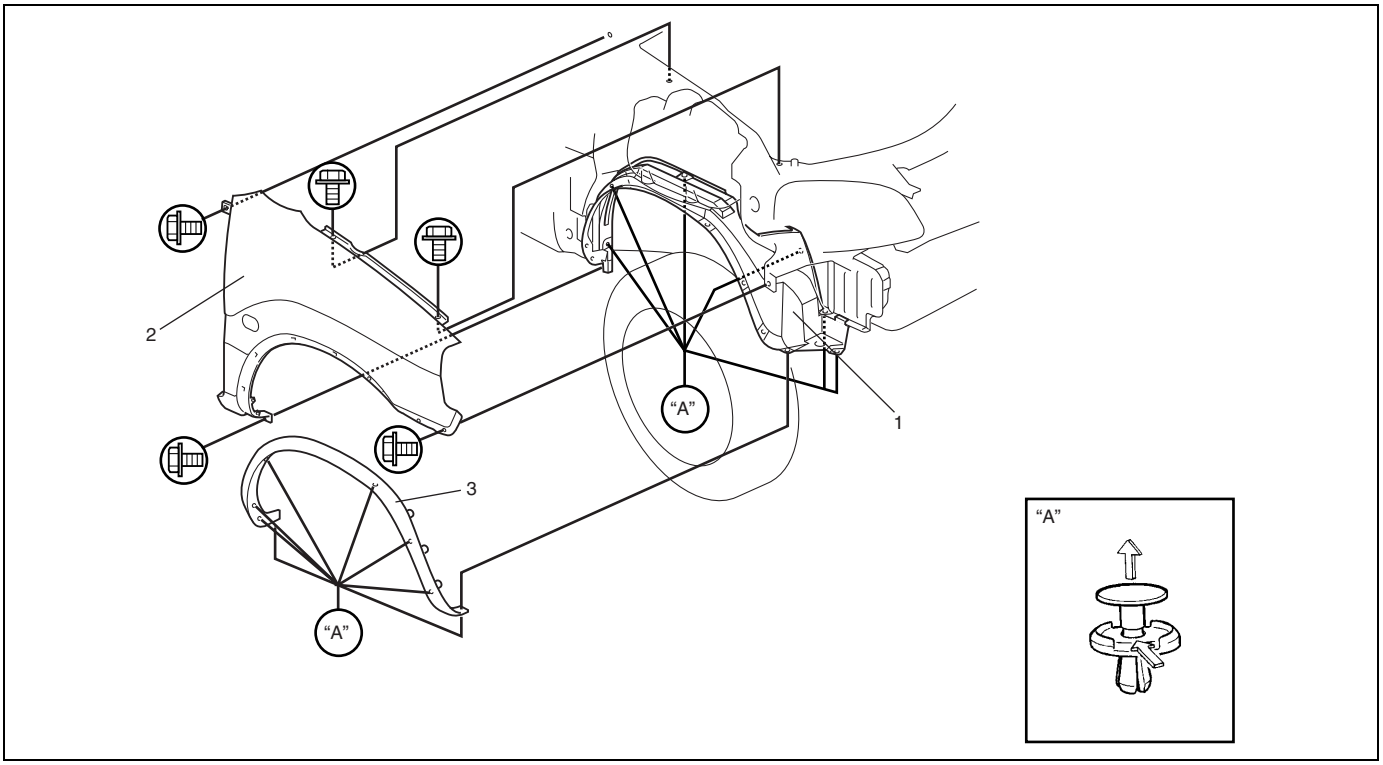
INSPECTION

Check that hood opens and closes smoothly and properly. Lubricate if necessary. Also check that secondary latch operates properly (check that secondary latch keeps hood from opening all the way) and hood locks securely when closed.
Adjust hood locks position if necessary.

FRONT FENDER



1. Front fender lining	2. Front fender	3. Front fender side moulding

REMOVAL

1) Remove front fender side moulding.
2) Remove front bumper.
3) Disconnect connector of side turn signal (or side marker) lamp.
4) Remove front fender lining.
5) Remove front fender.

INSTALLATION

Reverse removal procedure to install front fender noting the following instructions.

- If paint on fender bolt is peeled off, be sure to apply paint again.
- Adjust panel clearance referring to "PANEL CLEARANCE" in this section.

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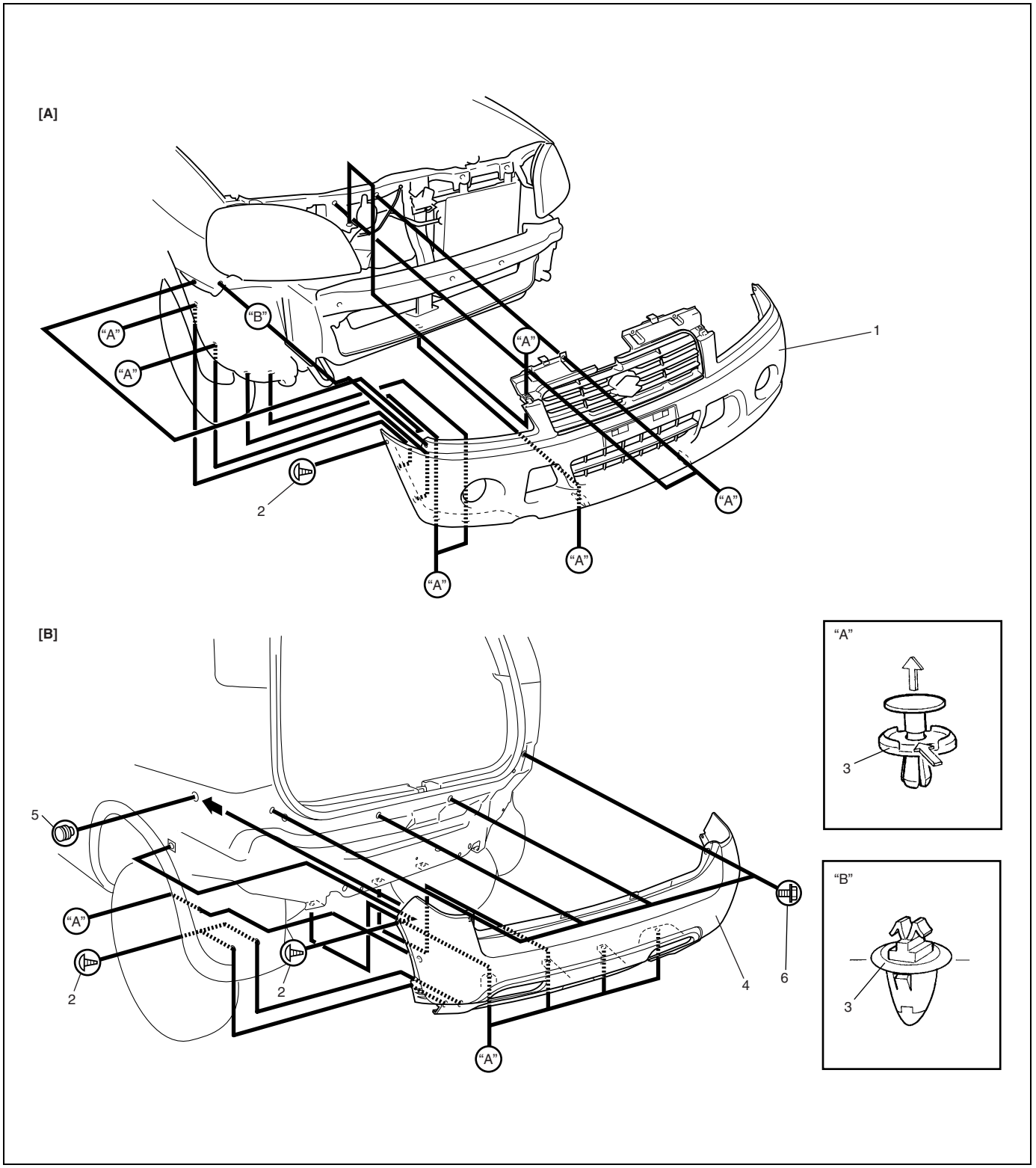
FRONT BUMPER AND REAR BUMPER



[A] : Front bumper	1. Front bumper	4. Rear bumper
[B] : Rear bumper	2. Screws	5. Damper
	3. Clip	6. Bolt

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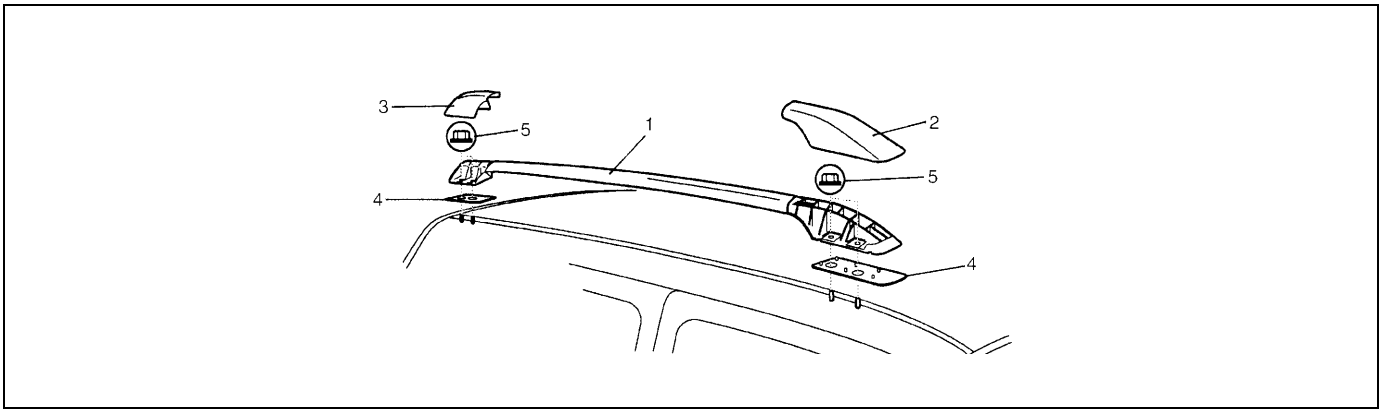
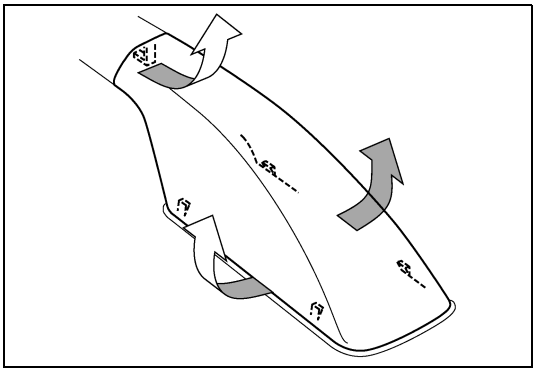
ROOF RAIL (IF EQUIPPED)



1.	Roof rail assembly
2.	Front cap
3.	Rear cap
4.	Base seal
5.	Nut

REMOVAL



1) Remove roof rail front and rear caps as shown in figure.
2) Remove nuts.
3) Remove roof rail assembly.

INSTALLATION

Reverse removal procedure for installation.
Confirm that each roof rail fixing nut is tightened securely.

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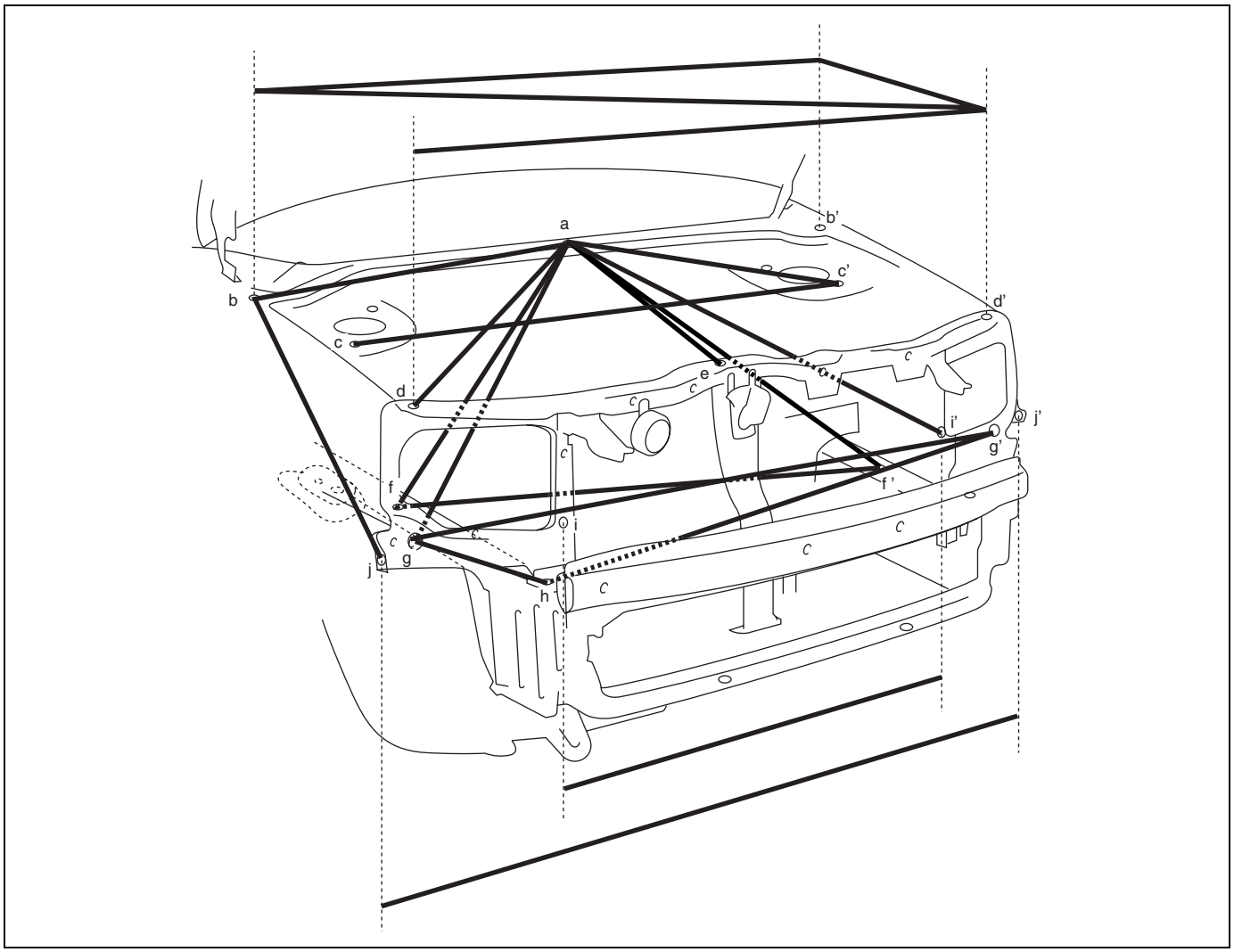
BODY DIMENSIONS

ENGINE ROOM



a. Garnish installation center hole (ϕ5)	e. Hood cushion installation hole	i (i'). Head light installation hole
b (b'). Front fender installation hole	f (f'). Engine mounting installation front hole	j (j'). Front fender installation hole
c (c'). Strut installation front hole	g (g'). Jig hole (ϕ15 mm)	
d (d'). Front fender installation hole	h. Bumper member upper side installation hole	

Hole to hole distance

a-b : 673 mm (26.50 in.)	**a-i' : 760 mm (29.92 in.)**	**f-f' : 954 mm (37.56 in.)**
a-c' : 584 mm (22.99 in.)	**b-b' : 1340 mm (52.76 in.)**	**g-g' : 1315 mm (51.77 in.)**
a-d : 793 mm (31.22 in.)	**b-d' : 1410 mm (55.51 in.)**	**g-h : 231 mm (9.09 in.)**
a-e : 584 mm (22.99 in.)	**b-j : 638 mm (25.12 in.)**	**g'-h : 1139 mm (44.84 in.)**
a-f : 774 mm (30.47 in.)	**b'-d' : 470 mm (18.50 in.)**	**i-i' : 866 mm (34.09 in.)**
a-f' : 836 mm (32.91 in.)	**c-c' : 1098 mm (43.23 in.)**	**j-j' : 1496 mm (58.90 in.)**
a-g : 889 mm (35.00 in.)	**d-d' : 1320 mm (51.97 in.)**	

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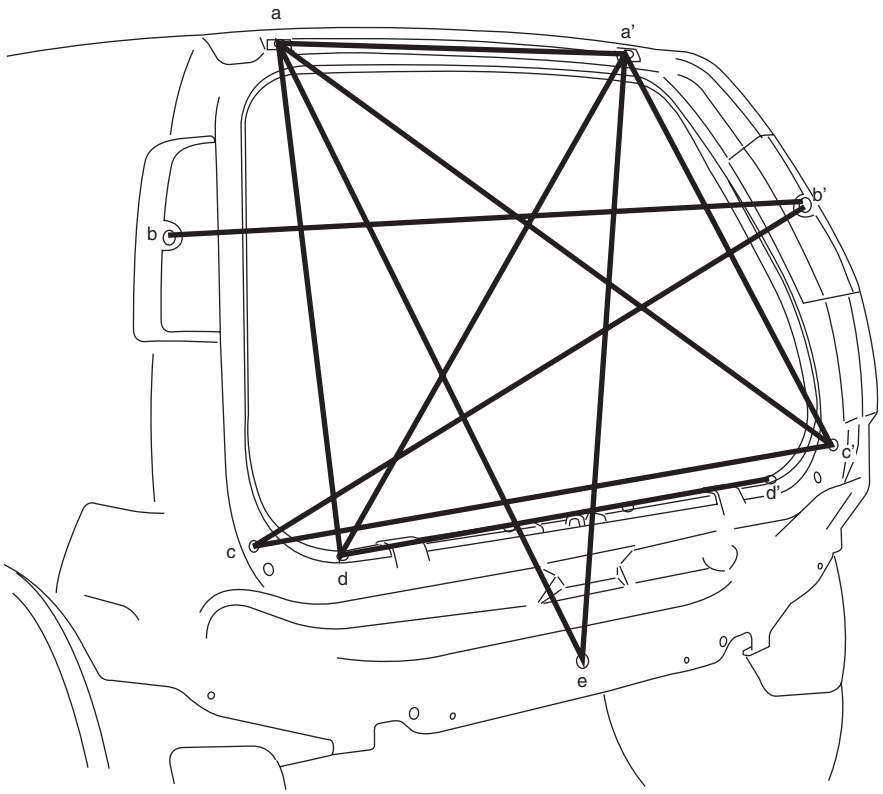
BACK DOOR



a (a'). Back door hinge installation hole	d (d'). Tail end member trim installation hole
b (b'). Rear combination lamp installation hole	e. Center jig hole (ϕ7 mm)
c (c'). Rear bumper installation hole	

Hole to hole distance

a-a' : 725 mm (28.54 in.)	**a'-c' : 794 mm (31.26 in.)**	**b'-c: 1333mm (52.48 in.)**
a-c' : 1229 mm (48.39 in.)	**a'-d : 1128 mm (44.41 in.)**	**c-c' : 1215 mm (47.83 in.)**
a-d : 799 mm (31.46 in.)	**a'-e : 1096 mm (43.15 in.)**	**d-d' : 875 mm (34.45 in.)**
a-e : 1096 mm (43.15 in.)	**b-b' : 1305 mm (51.38 in.)**	

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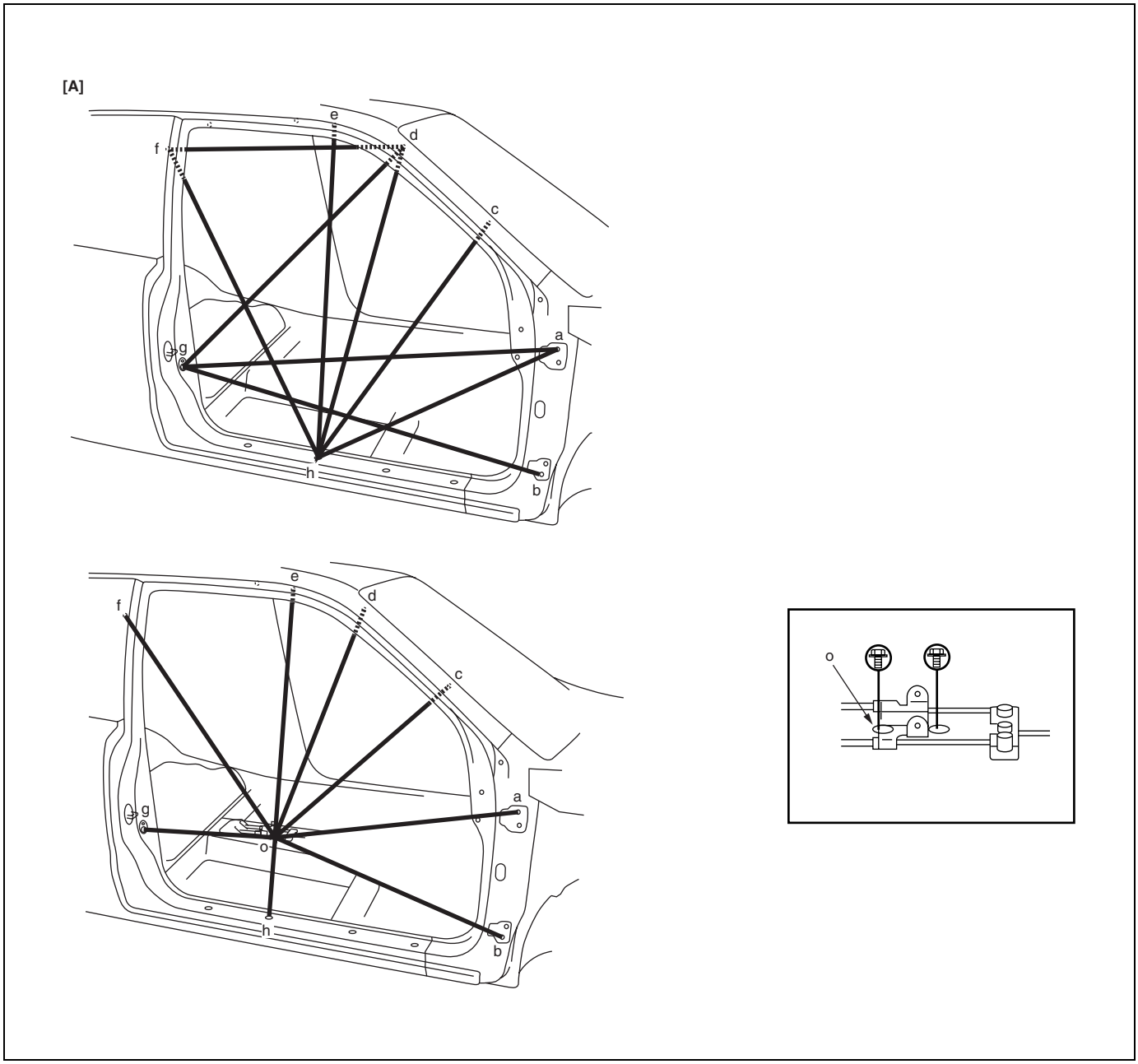
SIDE BODY



[A] : 3 door model	f. Front shoulder adjuster installation upper hole
a. Door upper hinge installation hole	g. Door switch installation hole
b. Door lower hinge installation hole	h. Side sill scuff installation hole
c. Front pillar inner trim installation lower hole	i. Parking brake cable bracket installation rear hole
d. Front pillar inner trim installation upper hole	
e. Assistant grip installation front hole	

Hole to hole distance

a-g : 1168 mm (45.98 in.)	**d-h : 1015 mm (39.96 in.)**	**d-o : 1252 mm (49.29 in.)**
a-h : 852 mm (33.54 in.)	**e-h : 1087 mm (42.80 in.)**	**e-o : 1244 mm (48.98 in.)**
b-g : 1188 mm (46.77 in.)	**f-h : 1091 mm (42.95 in.)**	**f-o : 1173 mm (46.18 in.)**
c-h : 924 mm (36.38 in.)	**a-o : 1317 mm (51.85 in.)**	**g-o : 799 mm (31.46 in.)**
d-f : 720 mm (28.35 in.)	**b-o : 1222 mm (48.11 in.)**	**h-o : 816 mm (32.13 in.)**
d-g : 933 mm (36.73 in.)	**c-o : 1283 mm (50.51 in.)**	

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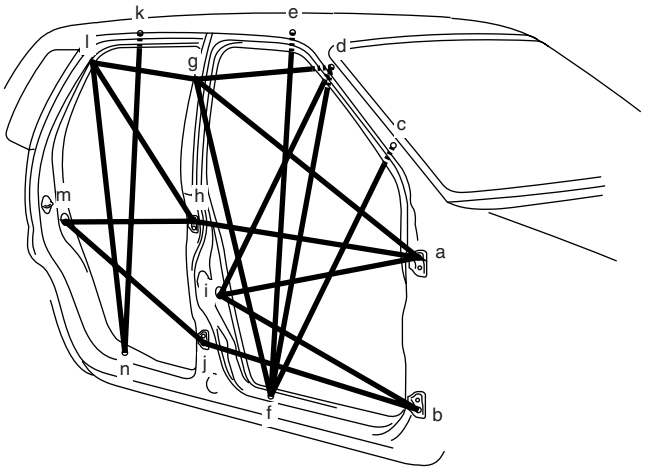
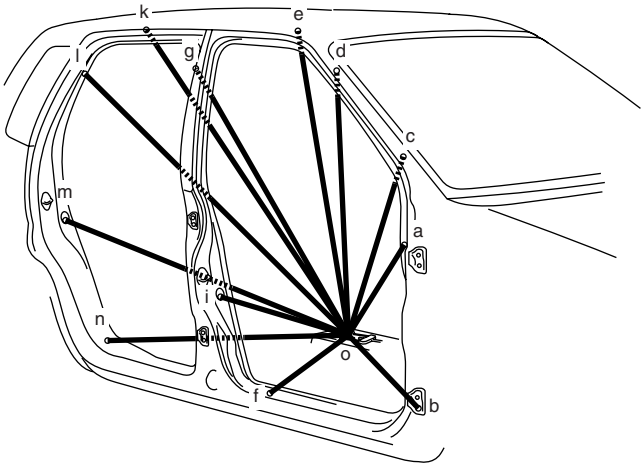
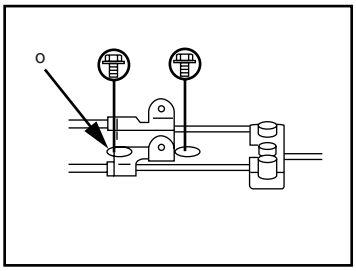
[B]







[B] : 5 door model	f. Side sill scuff installation rear hole	l. Rear door rear notch
a. Front door upper hinge installation hole	g. Front shoulder adjuster installation upper hole	m. Rear door switch installation hole
b. Front door lower hinge installation hole	h. Rear door upper hinge installation hole	n. Side soil scuff installation rear hole
c. Front pillar inner trim installation lower hole	i. Front door switch installation hole	o. Parking brake cable bracket installation rear hole
d. Front pillar inner trim installation upper hole	j. Rear door lower hinge installation hole	p. Steering support member installation hole
e. Assistant grip installation front hole	k. Assistant grip installation hole	

Hole to hole distance

a-g : 1166 mm (45.90 in.)	**d-i : 820 mm (32.28 in.)**	**i-o : 742 mm (29.21 in.)**
a-h : 942 mm (37.09 in.)	**d-o : 1252 mm (49.29 in.)**	**j-m : 895 mm (35.24 in.)**
a-i : 901 mm (35.47 in.)	**e- f : 1077 mm (42.40 in.)**	**k-n : 1089 mm (42.87 in.)**
b-i : 891 mm (35.08 in.)	**e-o : 1244 mm (48.98 in.)**	**k-o : 1321 mm (52.01 in.)**
b-j : 902 mm (35.51 in.)	**f-g: 1048 mm (41.26 in.)**	**l-n : 948 mm (37.32 in.)**
b-o : 1222 mm (48.11 in.)	**f-o 785 mm (30.91 in.)**	**l-o : 1323 mm (52.09 in.)**
c-f : 884 mm (34.80 in.)	**g-l : 621 mm (24.45 in.)**	**m-o : 1111 mm (43.74 in.)**
c-o: 1282 mm (50.47 in.)	**g-o : 1147 mm (45.16 in.)**	**n-o : 813 mm (32.00 in.)**
d-f : 993 mm (39.09 in.)	**h-l : 846 mm (33.31 in.)**	**o-p : 1229 mm (48.39 in.)**
d-g : 580 mm (22.83 in.)	**h-m : 813 mm (32.01 in.)**	

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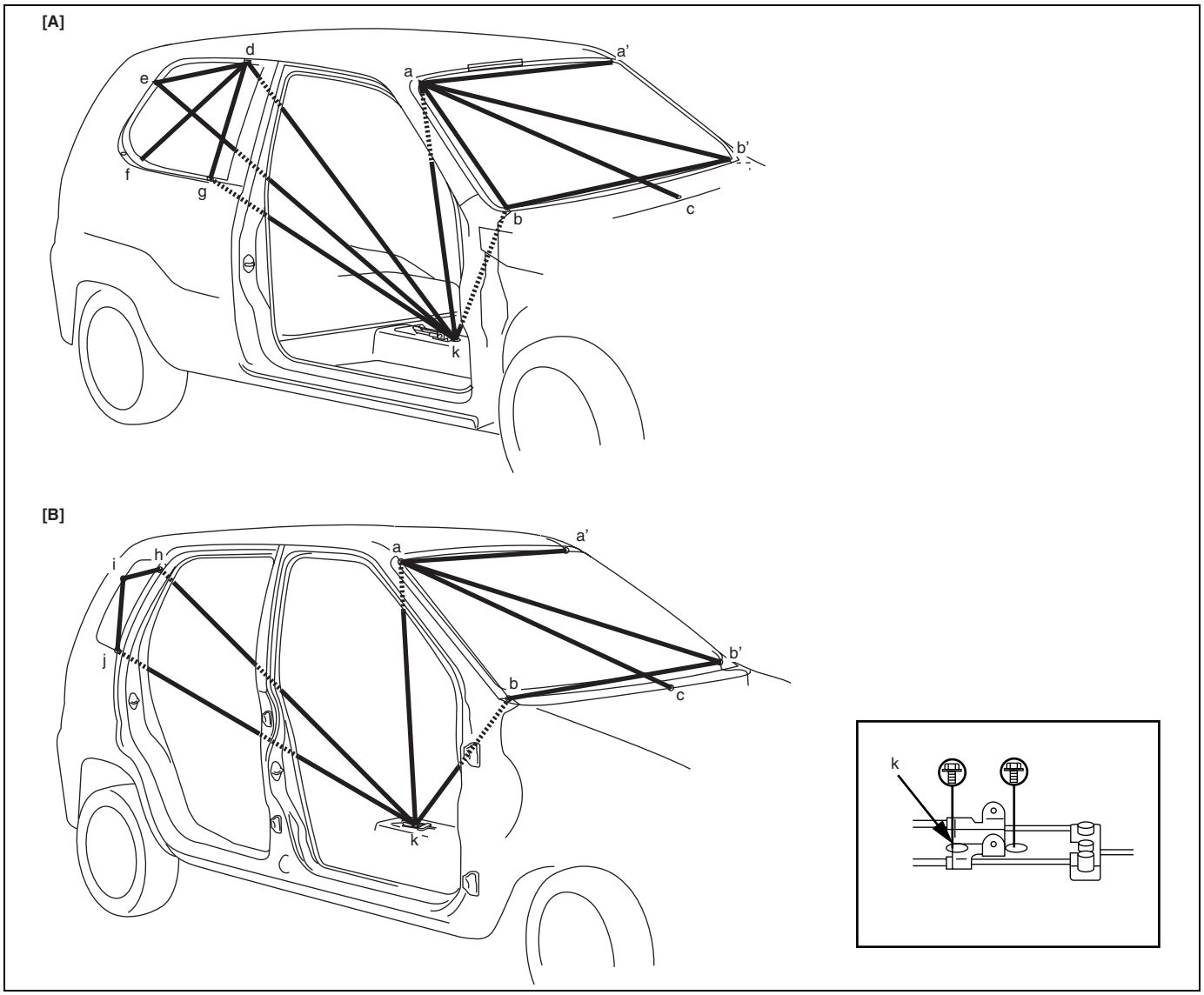

[A] : 3 door model	f. Quarter window lower side rear mounting hole (5.1 x 8.6 mm)
[B] : 5 door model	g. Quarter window lower side front mounting hole (5.1 x 8.6 mm)
a (a'). Front end of front windshield upper installation section	h. Quarter window upper notch
b (b). Front end of front windshield lower installation section	i. Quarter window rear notch
c. Garnish installation center hole (ϕ5 mm)	j. Quarter window lower mounting hole (5.1 x 8.6 mm)
d. Quarter window upper side front notch	k. Parking brake cable bracket installation rear hole
e. Quarter window rear notch	

Hole to hole distance

a-a' : 1047 mm (41.22 in.)	**b-k : 1411 mm (55.55 in.)**	**f-k : 1373 mm (54.06 in.)**
a-b : 688 mm (27.01 in.)	**d-e : 577 mm (22.72 in.)**	**g-k : 1092 mm (42.99 in.)**
a-b' : 1356 mm (53.39 in.)	**d-f : 623 mm (24.53 in.)**	**h-i : 237 mm (9.33 in.)**
a-c : 1032 mm (40.63 in.)	**d-g : 363 mm (14.29 in.)**	**h-k : 1430 mm (56.30 in.)**
a-k : 1282 mm (50.47 in.)	**d-k : 1271 mm (50.04 in.)**	**i-j : 242 mm (9.53 in.)**
b-b' : 1305 mm (51.38 in.)	**e-k : 1474 mm (58.03 in.)**	**j-k : 1413 mm (55.63 in.)**

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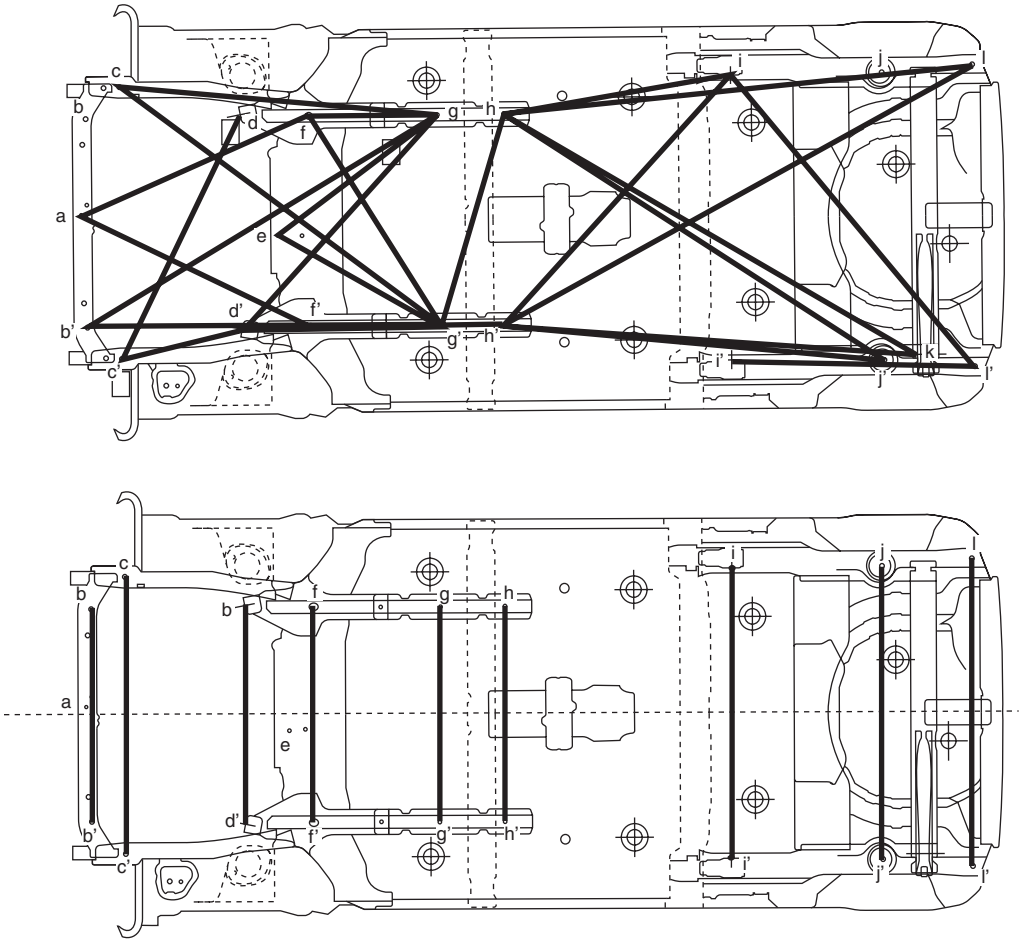
UNDER BODY



a. Jack bracket installation hole	g (g'). Jig hole (ϕ10 mm)
b (b'). Front stabilizer bracket front installation hole	h (h'). Jig hole (ϕ10 mm)
c (c'). Front stabilizer bracket rear installation hole	i (i'). Trailing arm installation hole
d (d'). Suspension control arm installation front hole	j (j'). Bump stopper installation hole
e. Rear engine mounting front installation hole	k. Lateral rod installation hole
f (f'). Jig hole (ϕ15 mm)	l (l'). Jig hole (ϕ16 mm)

Hole to hole distance

a-f : 909 mm (35.79 in.)	**d'-g' : 708 mm (27.87 in.)**	**h-k : 1724 mm (67.87 in.)**
a-f' : 862 mm (33.94 in.)	**e-g : 702 mm (27.64 in.)**	**h-l : 1718 mm (67.64 in.)**
b-b' : 740 mm (29.13 in.)	**e-g' : 647 mm (25.47 in.)**	**h'-i : 1204 mm (47.40 in.)**
b'-g : 1464 mm (57.64 in.)	**f-f' : 754 mm (29.68 in.)**	**h'-j' : 1384 mm (54.45 in.)**
b'-g' : 1259 mm (49.57 in.)	**f-g : 471 mm (18.54 in.)**	**h'-k : 1497 mm (58.94 in.)**
c-c' : 968 mm (38.11 in.)	**f-g' : 889 mm (35.00 in.)**	**h'-l : 1940 mm (76.38 in.)**
c-g : 1148 mm (45.20 in.)	**g-g' : 754 mm (29.68 in.)**	**i-i' : 1017 mm (40.04 in.)**
c-g' : 1431 mm (56.34 in.)	**g'-h : 791 mm (31.14 in.)**	**i-l' : 1392 mm (54.80 in.)**
c'-d : 970 mm (38.19 in.)	**g'-h' : 240 mm (9.45 in.)**	**i'-l' : 918 mm (36.14 in.)**
c'-d' : 452 mm (17.80 in.)	**h-h' : 754 mm (29.68 in.)**	**j-j' : 1028 mm (40.47 in.)**
d-d' : 761 mm (29.96 in.)	**h-i : 826 mm (32.52 in.)**	**l-l' : 1076 mm (42.36 in.)**
d'-g : 1037 mm (40.83 in.)	**h-j' : 1640 mm (64.57 in.)**	

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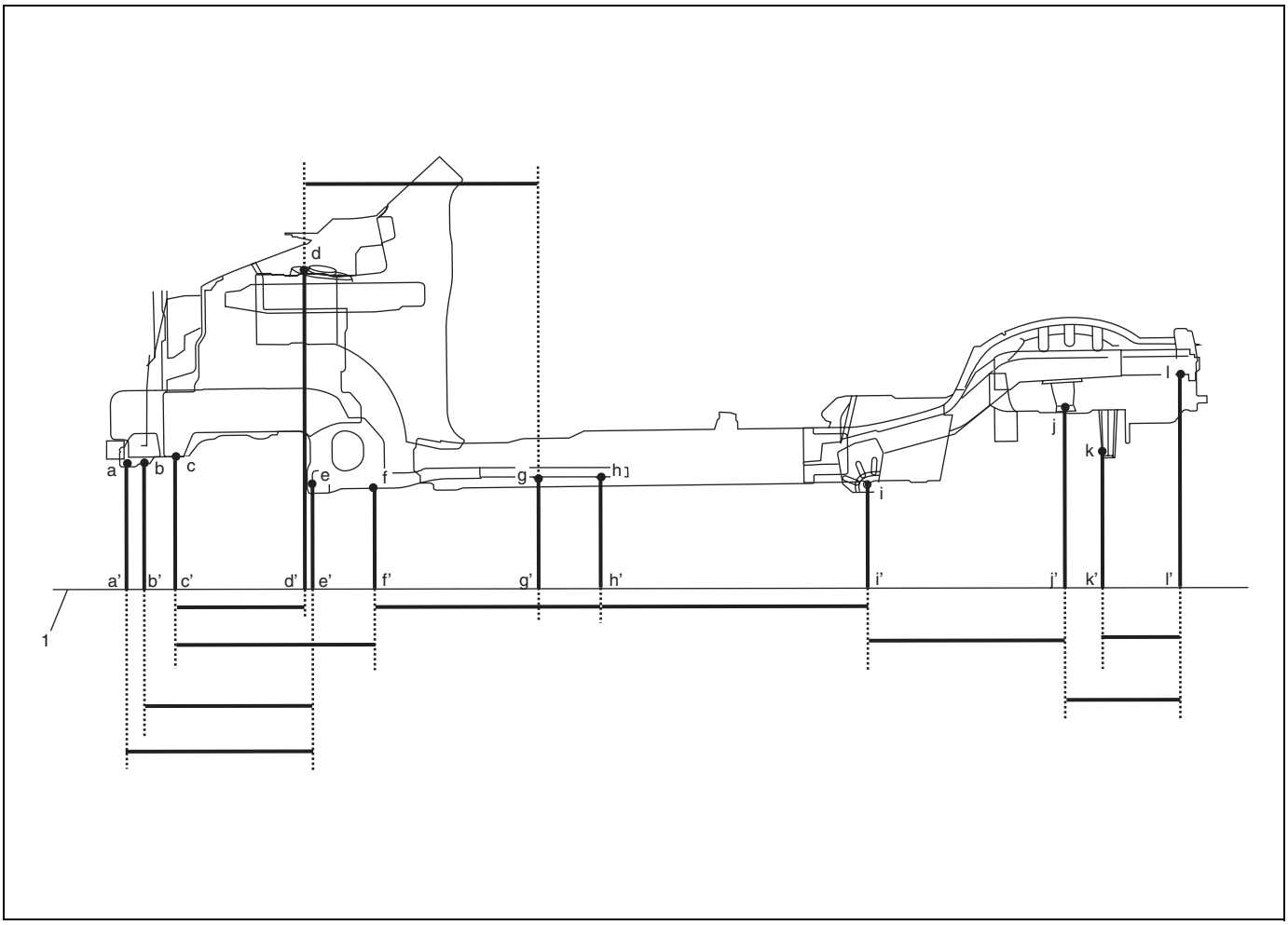

1. Virtual baseline	g. Jig hole (ϕ10 mm)
a. Jack bracket installation hole	h. Jig hole (ϕ10 mm)
b. Front stabilizer bracket front installation hole	i. Trailing arm installation hole
c. Front stabilizer bracket rear installation hole	j. Bump stopper installation hole
d. Strut installation front hole	k. Lateral rod installation hole
e. Suspension control arm installation front hole	l. Jig hole (ϕ16 mm)
f. Jig hole (ϕ15 mm)	

Point to point distance

a-a' : 133 mm (5.24 in.)	**e-e' : 77 mm (3.03 in.)**	**i-i' : 85 mm (3.35 in.)**
a-e' : 558 mm (21.97 in.)	**e'-f' : 238 mm (9.37 in.)**	**i'-j' : 546 mm (21.50 in.)**
b-b' : 133 mm (5.24 in.)	**f-f' : 55 mm (2.17 in.)**	**j-j' : 292 mm (11.50 in.)**
b'-e' : 550 mm (21.65 in.)	**f'-g' : 470 mm (18.50 in.)**	**j'-l' : 324 mm (12.76 in.)**
c-c' : 162 mm (6.38 in.)	**g-g' : 80 mm (3.15 in.)**	**k-k' : 139 mm (5.47 in.)**
c'-d' : 391 mm (15.39 in.)	**g'-h' : 240 mm (9.45 in.)**	**k'-l' : 193 mm (7.60 in.)**
c'-e' : 432 mm (17.01 in.)	**h-h' : 80 mm (3.15 in.)**	**l-l' 375 mm (14.76 in.)**
d-d' : 648 mm (25.51 in.)	**h'-i' 815 mm (32.09 in.)**	
d'-g' : 749 mm (29.49 in.)		

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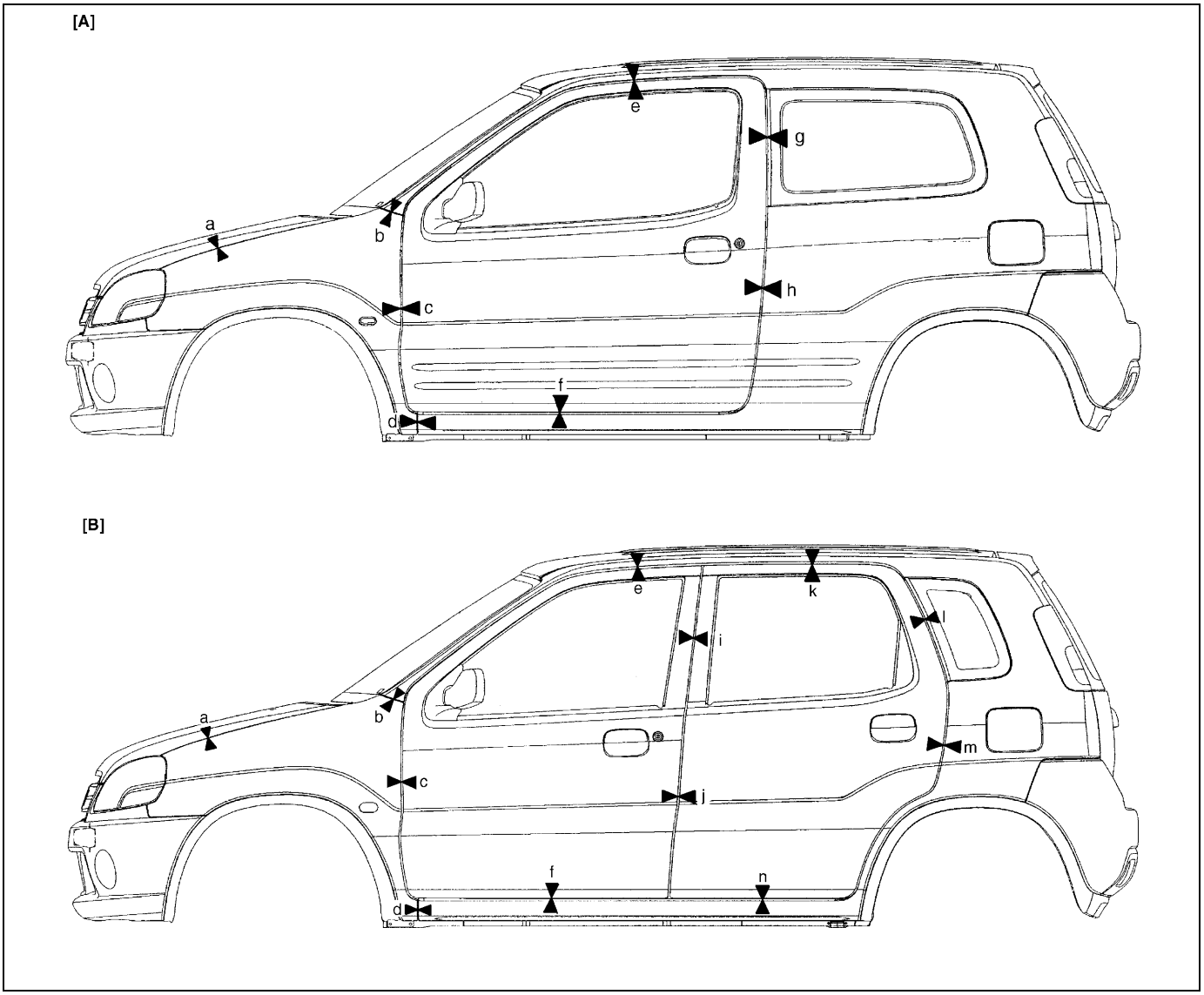
PANEL CLEARANCE



[A] : 3 door model	[B] : 5 door model

Panel to panel distance

a : 2.4-4.4 mm (0.094-0.173 in.)	**h : 3.6-5.6 mm (0.142-0.220 in.)**
b : 1.7-3.7 mm (0.067-0.146 in.)	**i : 3.6-5.6 mm (0.142-0.220 in.)**
c : 4.2-6.2 mm (0.165-0.244 in.)	**j : 4.2-6.2 mm (0.165-0.244 in.)**
d : 1.7-3.7 mm (0.067-0.146 in.)	**k : 5.0-7.0 mm (0.197-0.276 in.)**
e : 5.0-7.0 mm (0.197-0.276 in.)	**l : 4.3-6.3 mm (0.169-0.248 in.)**
f : 4.7-6.7 mm (0.185-0.264 in.)	**m : 3.6-5.6 mm (0.142-0.220 in.)**
g : 4.3-6.3 mm (0.169-0.248 in.)	**n : 4.7-6.7 mm (0.185-0.264 in.)**

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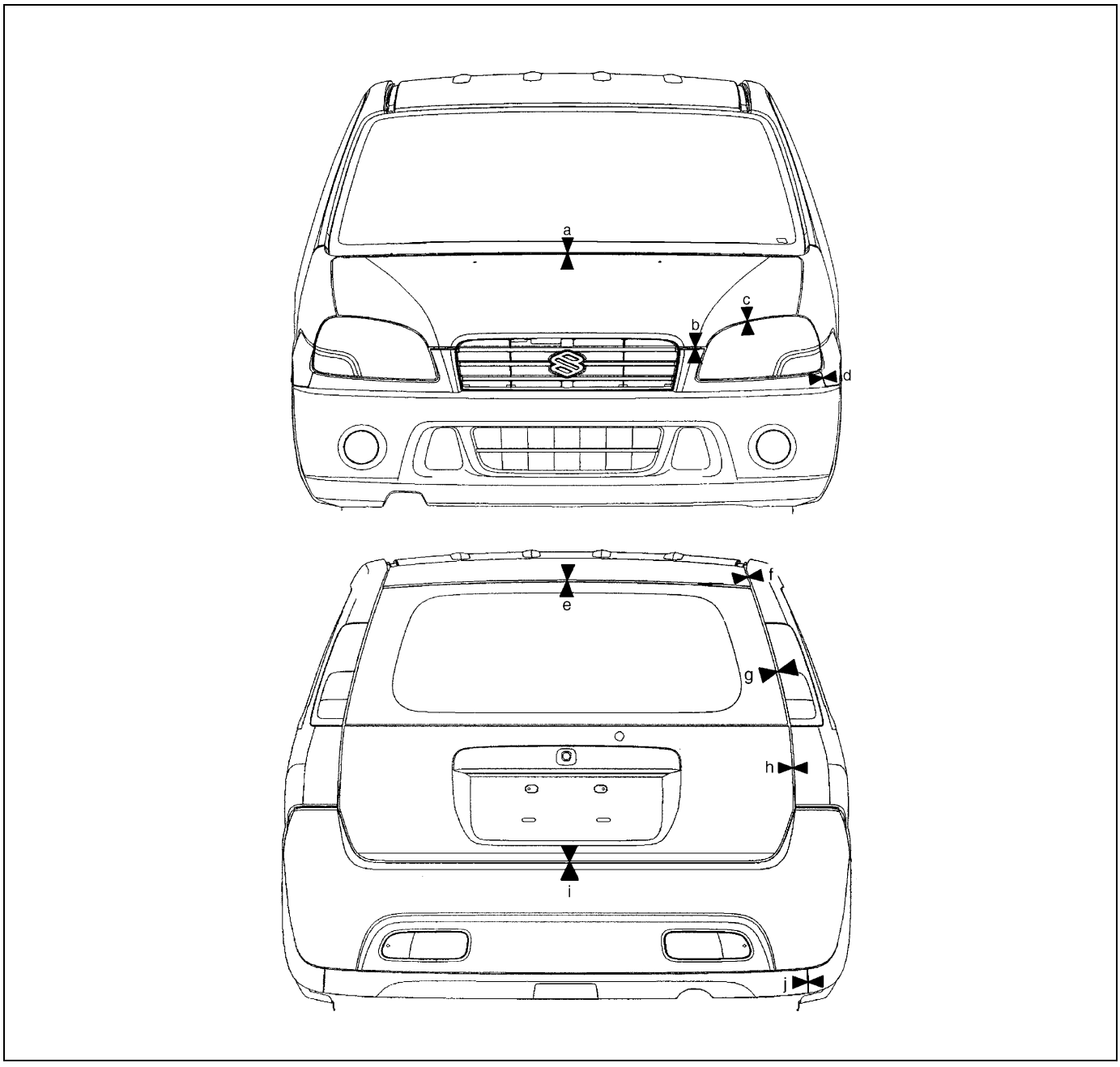

Panel to panel distance

a : 4.8-6.8 mm (0.189-0.268 in.)	**f : 3.5-5.5 mm (0.138-0.217 in.)**
b : 6.6-8.6 mm (0.260-0.339 in.)	**g : 4.3-6.3 mm (0.169-0.248 in.)**
c : 3.7-5.7 mm (0.146-0.244 in.)	**h : 3.5-5.5 mm (0.138-0.217 in.)**
d : 1.5-2.5 mm (0.059-0.098 in.)	**i : 5.3-7.3 mm (0.209-0.287 in.)**
e : 7.1-8.6 mm (0.280-0.339 in.)	**j : 1.0-3.0 mm (0.039-0.118 in.)**

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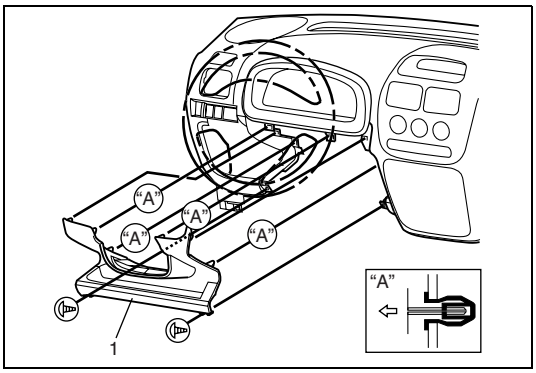
INSTRUMENTATION AND DRIVER INFORMATION

INSTRUMENT PANEL

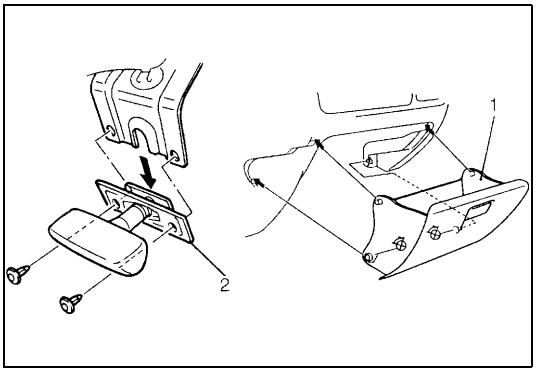
WARNING:
See WARNING at the beginning of this section.

REMOVAL

1) Disconnect negative cable at battery.
2) Disable air bag system, if equipped. Refer to “DISABLE AIR BAG SYSTEM” in Section 10B.

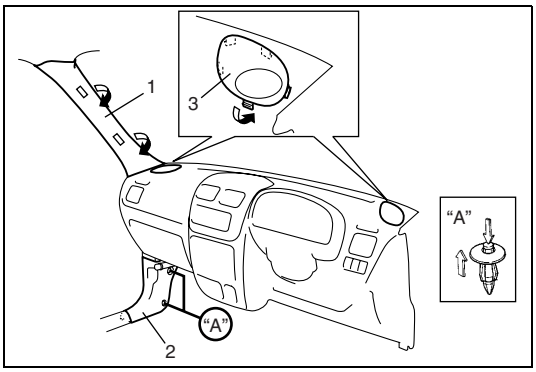


3) Remove steering column hole cover (1).



4) Remove glove box (1) and food latch release lever (2).

5) Disconnect instrument panel harness connectors, antenna and heater control cables which need to be disconnected for removal for instrument panel.
6) Remove instrument panel ground wire.
7) Remove steering column assembly referring to “STEERING COLUMN ASSEMBLY” in Section 3C.



8) Remove front pillar trims (1) and dash side trims (2).
9) Remove speaker covers (3).

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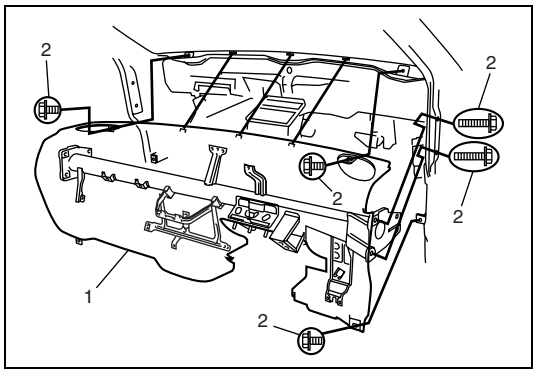
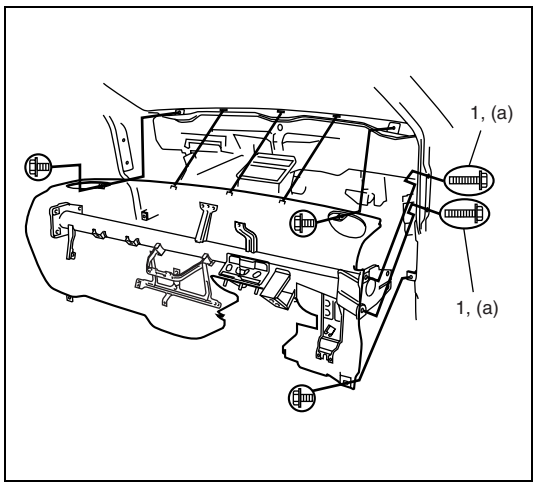


10) Remove instrument panel mounting bolts (2).
11) Remove instrument panel (1) with steering support member and instrument panel harness.

INSTALLATION

Reverse removal procedure to install instrument panel noting the following instructions.

- When installing each part, be careful not to catch any cable or wiring harness.



- Tighten instrument panel mounting bolts (1) to specified torque

Tightening torque
Instrument panel mounting bolts (a) :
23 N·m (2.3 kg-m, 17.0 lb-ft)

- When installing steering column assembly, refer to “STEERING COLUMN ASSEMBLY” in Section 3C.
- Adjust control cables. Refer to “HEATER CONTROL ASSEMBLY” in Section 1A.
- Enable air bag system if equipped. Refer to “ENABLING AIR BAG SYSTEM” in Section 10B.

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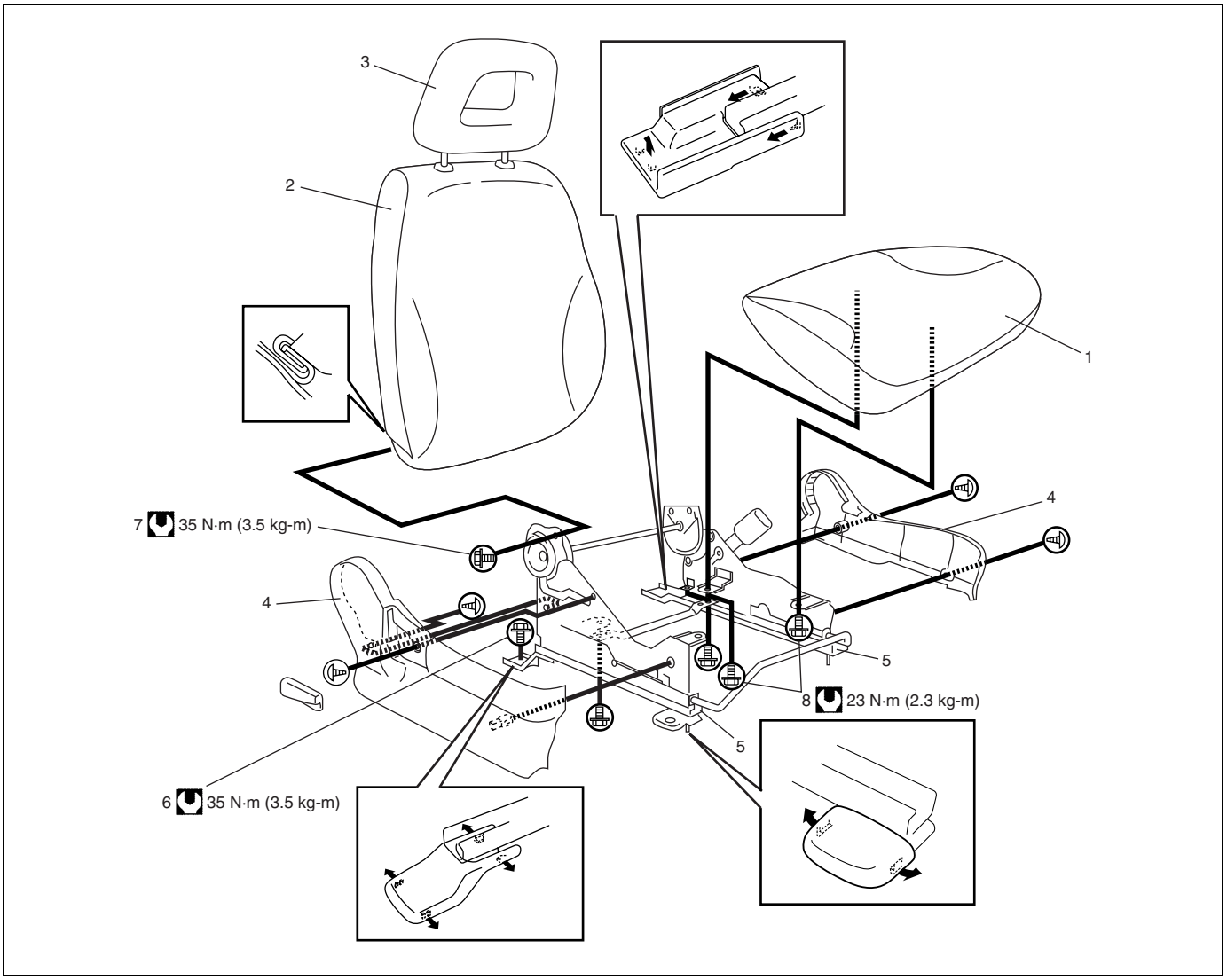
SEATS

FRONT SEAT



1. Seat cushion	4. Cover	7. Reclining bolt
2. Seat back	5. Seat adjuster	8. Seat cushion bolt
3. Head rest	6. Seat adjuster bolt	Tightening torque

REMOVAL

1) Remove console box.
2) Remove 4 mounting bolts to remove seat assembly.
3) Disassemble and repair seat as necessary.

INSTALLATION

Reverse removal procedure to install front seat.
Torque to specifications as shown.

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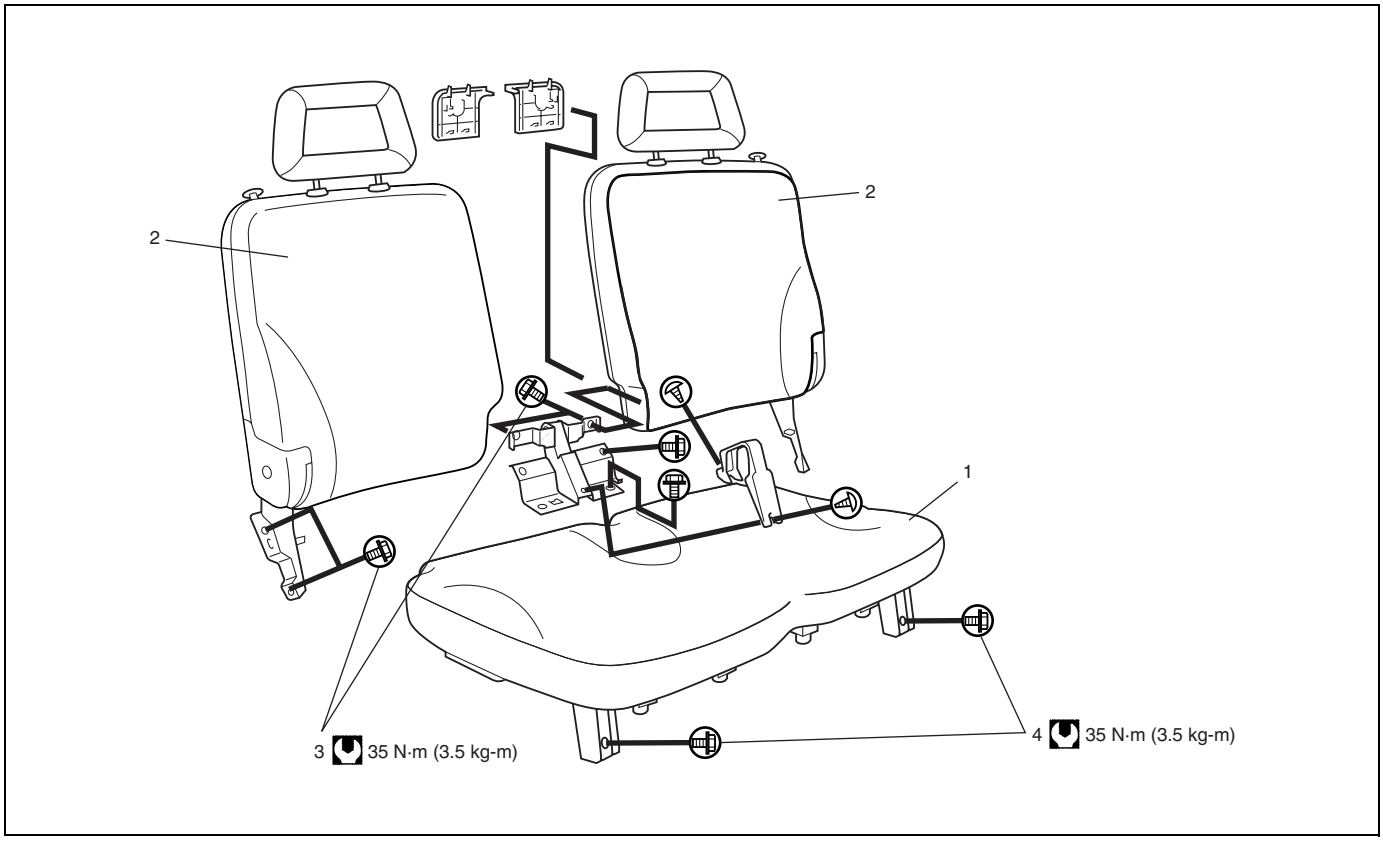
REAR SEAT



1. Seat cushion	4. Seat cushion bolt
2. Seat back	Tightening torquer
3. Seat back bolt	

REMOVAL

1) Remove 2 seat cushion bolts to remove seat cushion.
2) Remove 3 seat back bolts to remove seat back.
3) Disassemble and repair seat as necessary.

INSTALLATION

Reverse removal procedure to install rear seat.
Torque to specifications as shown.

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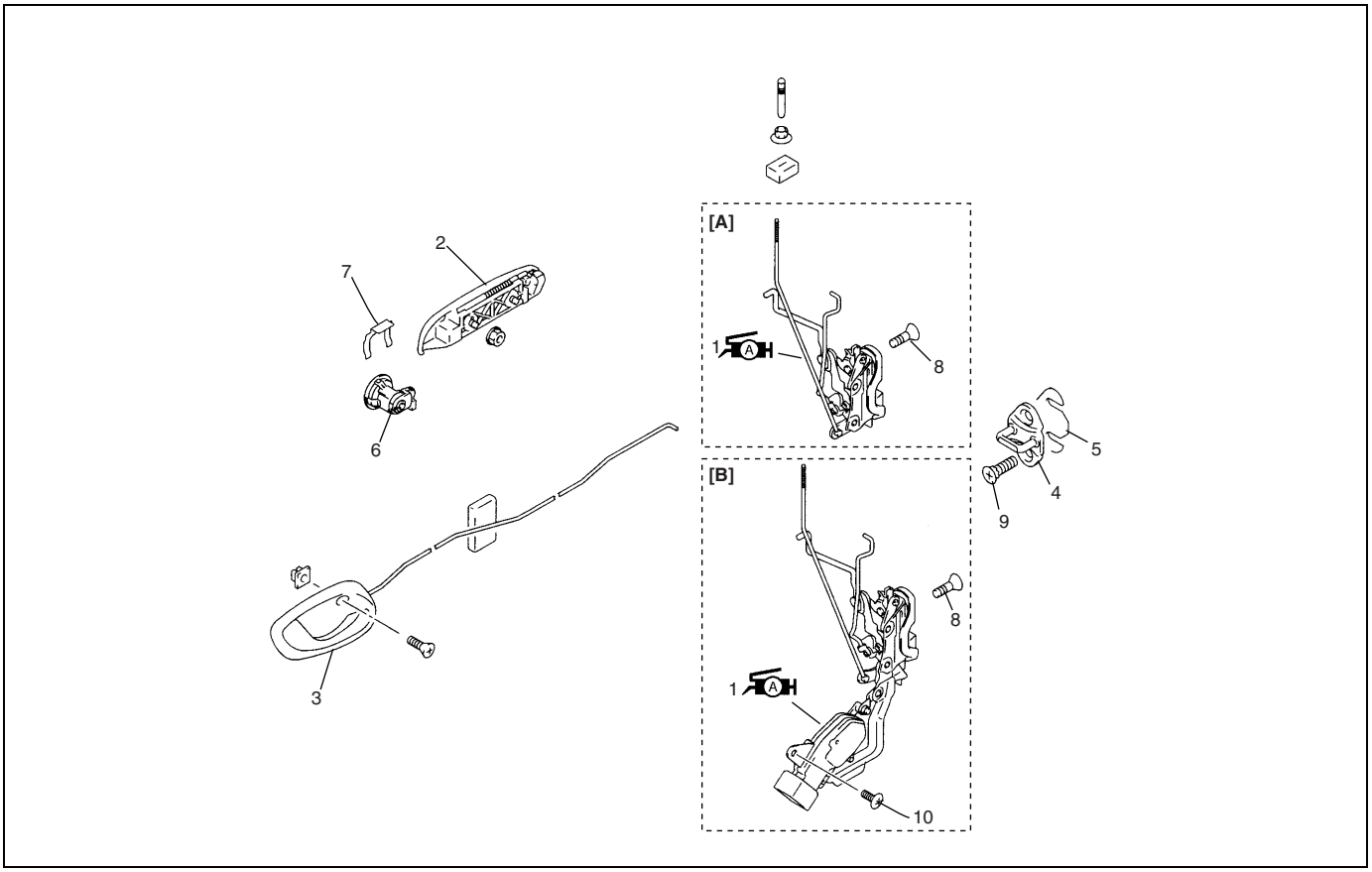
SECURITY AND LOCKS

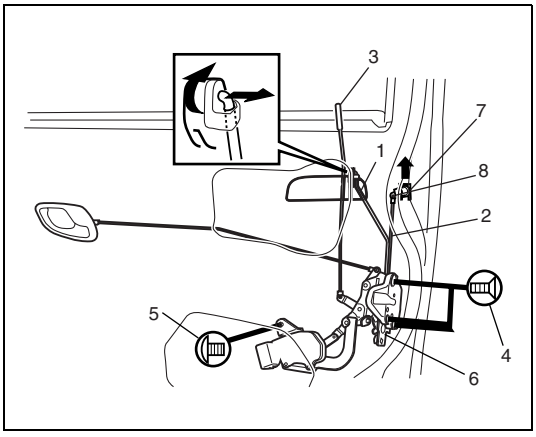
FRONT DOOR LOCK ASSEMBLY



[A] : Without power door lock model	3. Inside handle bezel	7. Key cylinder retainer
[B] : With power door lock model	4. Latch striker	8. Door latch screw
1. Front door latch assembly : Apply lithium grease 99000-25010 to sliding part	5. Shim	9. Door latch striker screw
2. Outside handle	6. Key cylinder	10. Door latch actuator screw

REMOVAL

1) Remove door trim and door sealing cover, refer to steps 1) to 6) of “REMOVAL” under “FRONT DOOR GLASS” in this section.
2) Raise window all the way up.
3) Remove door sash.



4) Disconnect door opening control rod (1) from outside handle.
5) Disconnect door latch control rod (2).
6) Disconnect door lock motor lead wire (if equipped).
7) Remove door lock knob (3).
8) Loosen door latch screw (4), door latch actuator screw (5) (if equipped power door lock) and remove door lock assembly (6).
9) Remove key cylinder retainer (7).
10) Remove key cylinder (8).

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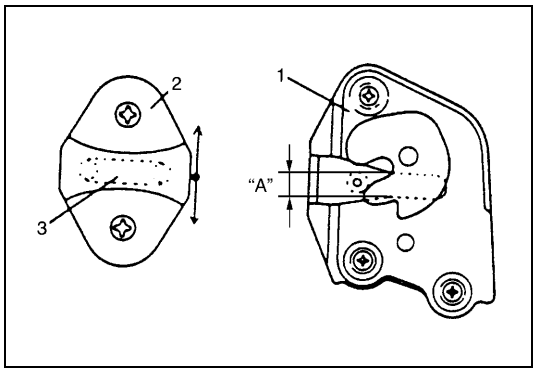
INSTALLATION

Reverse removal procedure to install front door lock assembly noting the following instructions.

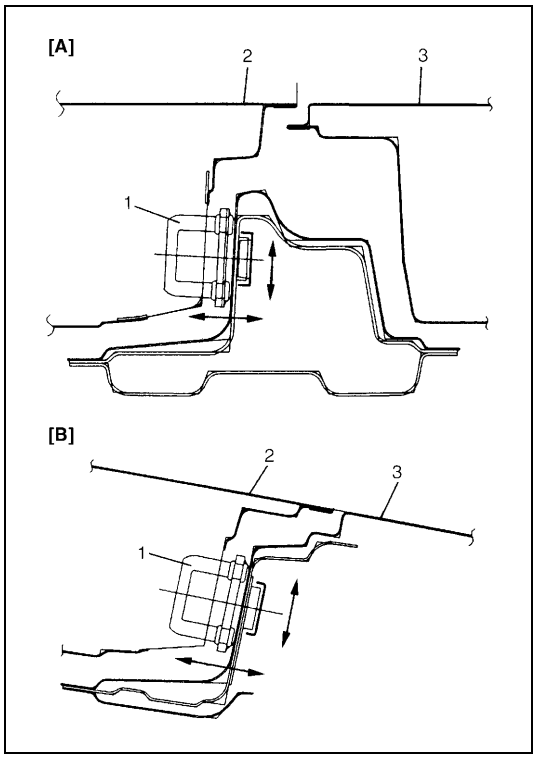
- Apply grease to sliding parts of door latch assembly.

Grease 99000-25010



- Move door latch striker (2) up or down so its center aligns with the center of groove "A" on the door lock assembly (1) as shown.
  Striker should be moved vertically and placed level. Do not adjust door lock.

3. Shaft



- Move door latch striker (1) sideways to adjust door outer panel surface (2) flush with rear door outer panel or body outer panel surface (3) as shown.
  In order to correctly obtain door lock operates, increase or decrease number of shims inserted between body and striker (1) to adjust it.

[A] : Front door
[B] : Rear door

INSPECTION

Check that door open and closes smoothly and properly.
Also check that door latch half look operates properly (check that door latch half lock keeps door from opening all the way) and door latch full locks securely when closed.
Adjust door latch striker position if necessary.

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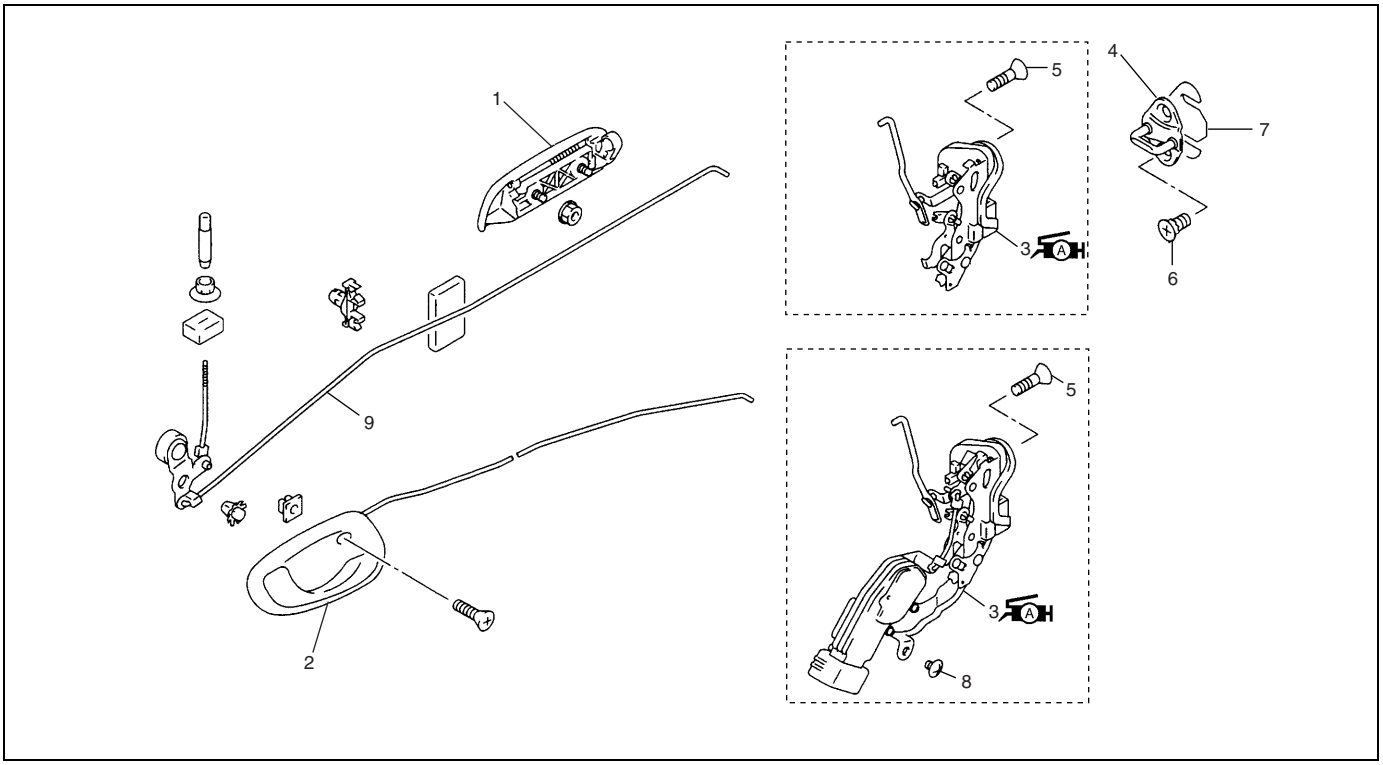
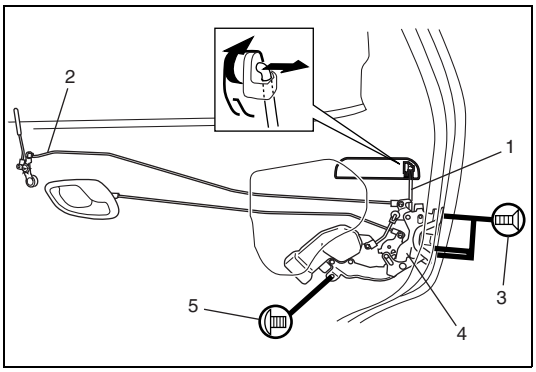
REAR DOOR LOCK ASSEMBLY (IF EQUIPPED)



	1. Outside handle	4. Latch striker	7. Shim
	2. Inside handle bezel	5. Door latch screw	8. Door latch actuator screw
A H	3. Rear door latch assembly : Apply lithium grease 99000-25010 to sliding part	6. Door latch striker screw	9. Door lock control rod

REMOVAL

1) Remove door trim and door sealing cover, refer to steps 1) to 7) of “REMOVAL” under “REAR DOOR GLASS (IF EQUIPPED)” in this section.



2) Disconnect door opening control rod (1) and door latch control rod (2).
3) Loosen door latch mounting screw (3), door latch actuator screw (5) (if equipped power door lock) and remove door lock assembly (4).

INSTALLATION

Reverse removal procedure to install rear door lock assembly referring to “FRONT DOOR LOCK ASSEMBLY” in this section.

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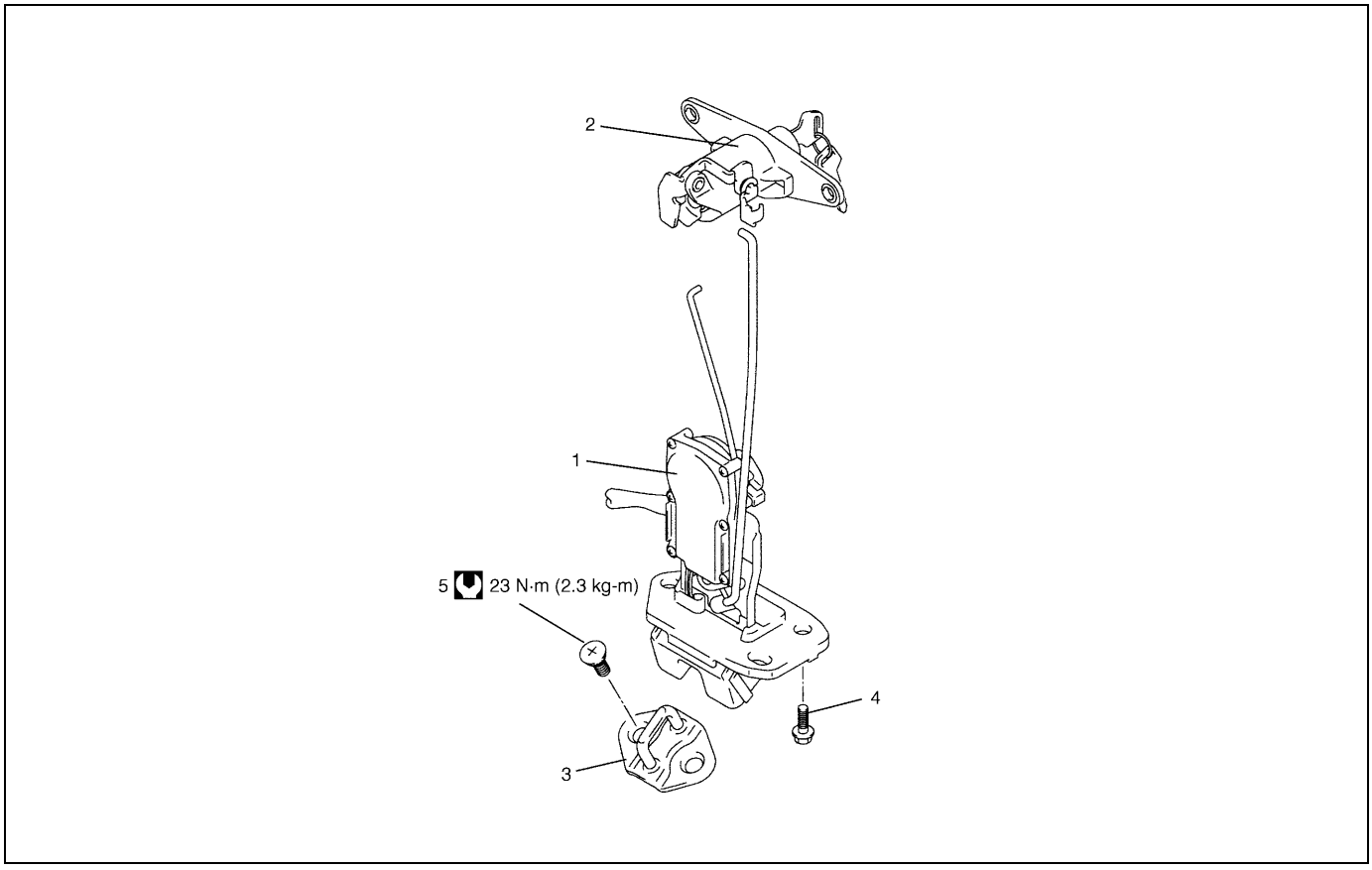
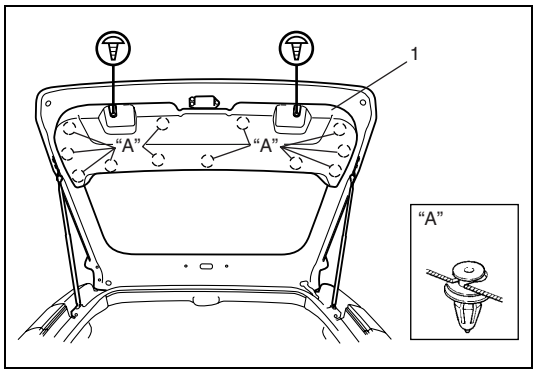
BACK DOOR LOCK ASSEMBLY

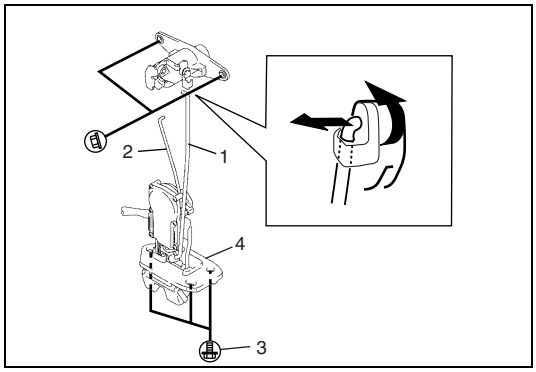


1. Back door latch assembly	3. Latch striker	5. Latch striker screw
2. Back door lock cylinder	4. Door latch screw	Tightening torque

REMOVAL



1) Remove door trim (1).



2) Disconnect door lock control rod (1).
   Disconnect control rod (2).
3) Disconnect door lock motor lead wire (if equipped).
4) Loosen door latch screw (3) and remove door latch assembly (4).

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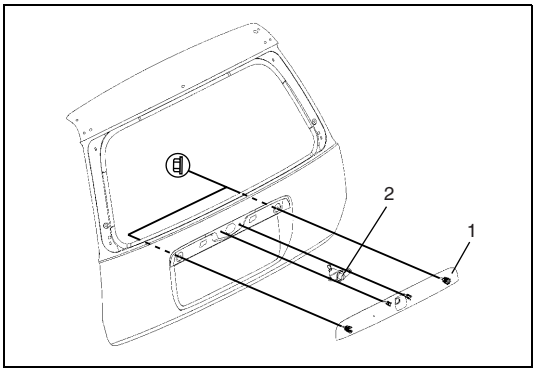
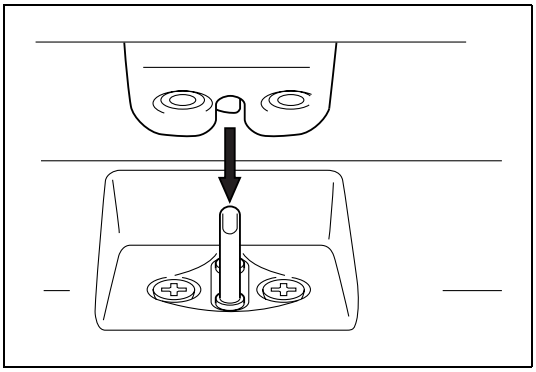


5) Remove back door licence garnish (1).
6) Remove back door lock cylinder (2).

INSTALLATION

Reverse removal procedure to install back door lock assembly noting the following instruction.



- Adjust door latch striker so that its center aligns with the center of groove in door latch base.

INSPECTION

Check that door open and closes smoothly and properly.
Also check that door latch half lock operates properly (Check that door latch half lock keeps door from opening all the way) and door latch full locks securely closed.
Adjust door latch striker position if necessary.

KEY CODING

KEY USAGE AND IDENTIFICATION

Key is used for ignition and door lock cylinder. Keys are cut on both edges to make them reversible.
Key identification is obtained from five character key code stamped on key code tag. Using this key code, key code cutting combination can be determined from a code list (available to owners of key cutting equipment from suppliers).
If key codes are not available from records or tags, key code can be obtained from the right hand door lock cylinder (if lock has not been replaced). Lock cylinders supplied by the factory as service parts are unmarked.
If original key is available, key code cutting combination can be determined by laying key.

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IGNITION SWITCH LOCK CYLINDER

REMOVAL AND INSTALLATION

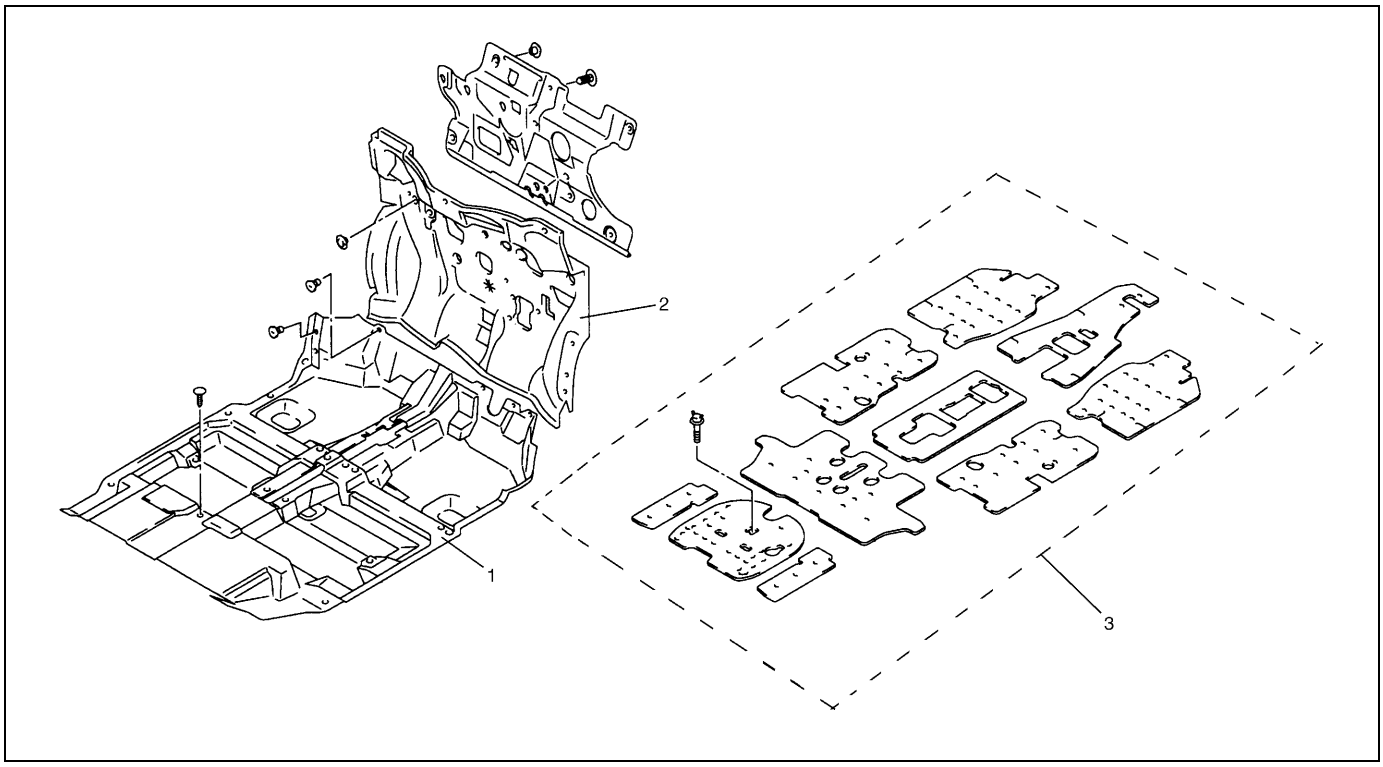
Refer to “STEERING LOCK ASSEMBLY (IGNITION SWITCH)” in Section 3C.

ELECTRICAL DIAGNOSIS

For ignition switch electrical troubleshooting, refer to “IGNITION SWITCH” in Section 8.

EXTERIOR AND INTERIOR TRIM

FLOOR CARPET



1.	Floor carpet
2.	Dash panel silencer
3.	Silencer seat

REMOVAL

1) Remove front seats and rear seat cushion.
2) Remove seat belt lower anchor bolt.
3) Remove dash side trims, front side sill scuffs, center pillar inner lower trims, quarter inner trims and rear side sill scuffs.
4) Remove parking brake lever cover and console box.
5) Remove floor carpet.

INSTALLATION

Reverse removal sequence to install front floor carpet, noting the following instruction.

- For tightening torque of seat belt anchor bolt, refer to “FRONT SEAT BELT” in Section 10.

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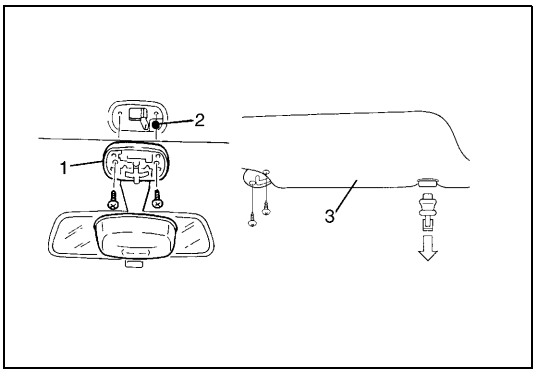
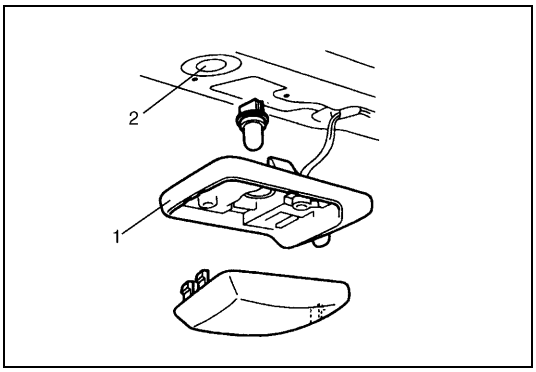
HEAD LINING

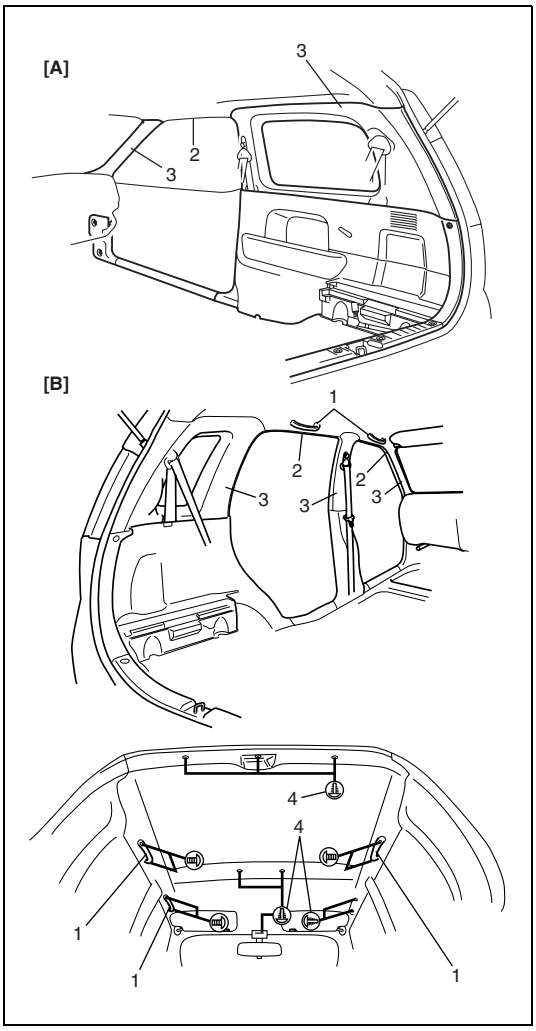
REMOVAL



1) Remove interior light (1).
2) Remove head lining clip (2).
3) Remove sun visor (3).



4) Remove luggage room light (1).
5) Remove head lining clip (2).



6) Remove assistant grip (1).
7) Remove door opening trim (2) and remove inner trims covering headlining (3).
8) Remove head lining clips (4) and remove head lining.

NOTE:

Adhesive is used to attach head lining.
Clear adhesive from headlining and roof after removing head lining if applied.

[A] :	For 3-door model
[B] :	For 5-door model

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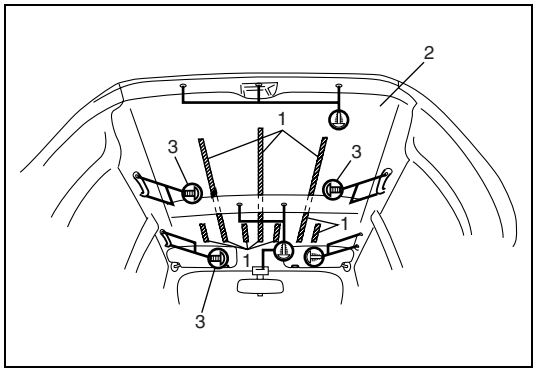
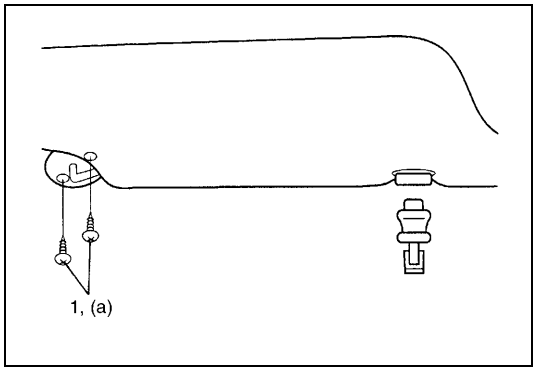
INSTALLATION



Reverse removal procedure to install head lining noting the following instructions.

- Apply double-face tape (1) to head lining (2) as shown figure, and then install head lining (2).
- Tighten assistant grip screw (3) to specified torque.

Tightening torque
Assistant grip screw : 4 N·m (0.4 kg-m, 2.8 lb-ft)



- Tighten sun visor screw (1) to specified torque.

Tightening torque
Sun visor screw (a) : 4 N·m (0.4 kg-m, 2.8 lb-ft)

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PAINT AND COATINGS

ANTI-CORROSION TREATMENT

WARNING:
Standard shop practices, particularly eye protection, should be followed during the performance of the below-itemized operations to avoid personal injury.

As rust proof treatment, steel sheets are given corrosion resistance on the interior and/or exterior.
These corrosion resistance steel sheet materials are called one of two-side galvanized steel sheets.
It is for the sake of rust protection that these materials are selected and given a variety of treatments as described blow.

- Steel sheets are treated with cathodic electroprimer which is excellent in corrosion resistance.
- Rust proof wax coatings are applied to door and side sill insides where moisture is liable to stay.
- Vinyl coating is applied to body underside and wheel housing inside.
- Sealer is applied to door hem, engine compartment steel sheet-to-steel sheet joint, and the like portions to prevent water penetration and resulting in rust occurrence.

In panel replacement or collision damage repair, leaving the relevant area untreated as it is in any operation which does disturb the above-mentioned rust proof treatment will cause corrosion to that area. Therefore, it is the essential function of any repair operation to correctly recoat the related surfaces of the relevant area.
All the metal panels are coated with metal conditioners and primer coating during vehicle production. Following the repair and/or replacement parts installation, every accessible bare metal surface should be cleaned and coated with rust proof primer. Perform this operation prior to the application of sealer and rust proof wax coating.
Sealer is applied to the specific joints of a vehicle during production. The sealer is intended to prevent dust from entering the vehicle and serves also as an anticorrosion barrier. The sealer is applied to the door and hood hem areas and between panels. Correct and reseal the originally sealed joints if damaged. Reseal the attaching joints of a new replacement panel and reseal the hem area of a replacement door or hood.
Use a quality sealer to seal the flanged joints, overlap joints and seams. The sealer must have flexible characteristics and paint ability after it's applied to repair areas.
For the sealer to fill open joints, use caulking material. Select a sealer in conformance with the place and purpose of a specific use. Observe the manufacturer's label-stand instructions when using the sealer.
In many cases, repaired places require color painting. When this is required, follow the ordinary techniques specified for the finish preparation, color painting and undercoating build-up.
Rust proof wax, a penetrative compound, is applied to the metal-to-metal surfaces (door and side sill insides) where it is difficult to use ordinary undercoating material for coating. Therefore, when selecting the rust proof wax, it may be the penetrative type.
During the undercoating (vinyl coating) application, care should be taken that sealer is not applied to the engine-related parts and shock absorber mounting or rotating parts. Following the under coating, make sure that body drain holes are kept open.
The sequence of the application steps of the anti-corrosion materials are as follows:

1) Clean and prepare the metal surface.
2) Apply primer.
3) Apply sealer (all joints sealed originally).
4) Apply color in areas where color is required such as hem flanges, exposed joints and under body components.
5) Apply anticorrosion compound (penetrative wax).
6) Apply undercoating (rust proof material).

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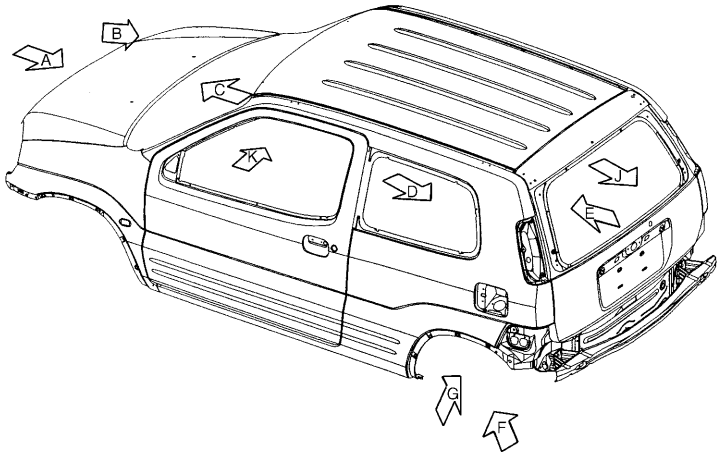
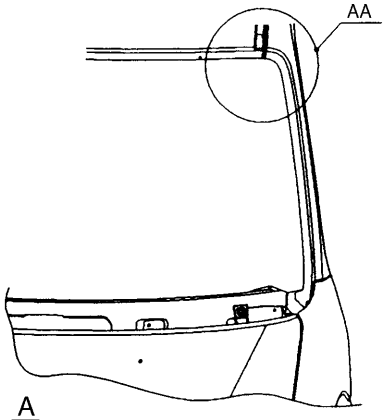
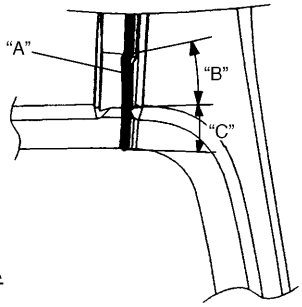
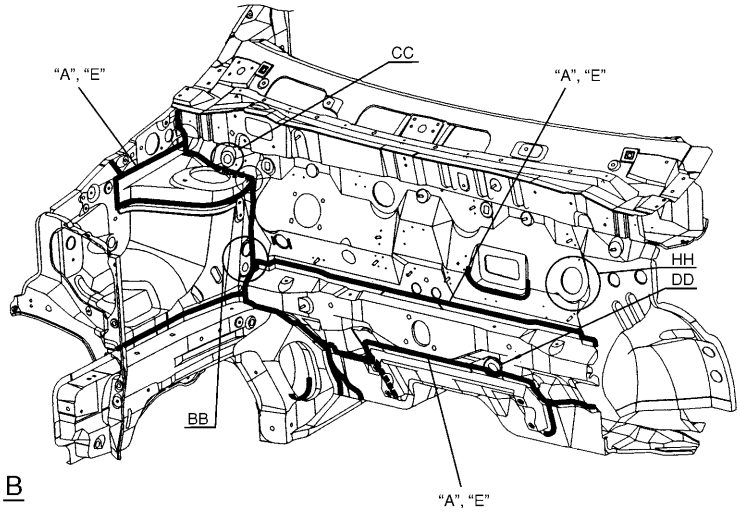
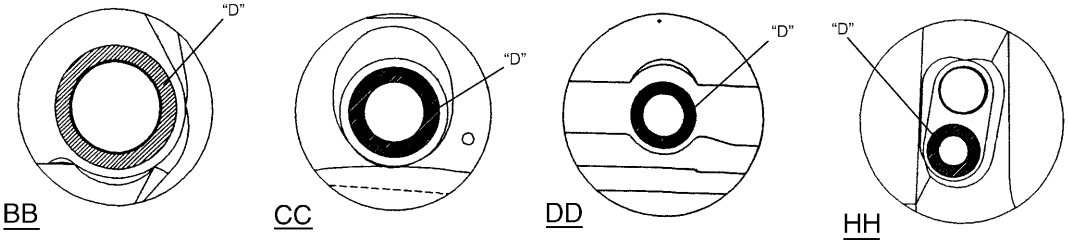
SEALANT APPLICATION AREAS











"A" : Apply sealant	"C" : Wipe off excess sealant after application	"E" : Smooth out sealant with a brush
"B" : Apply sealant without heeling	"D" : Do not apply sealant	

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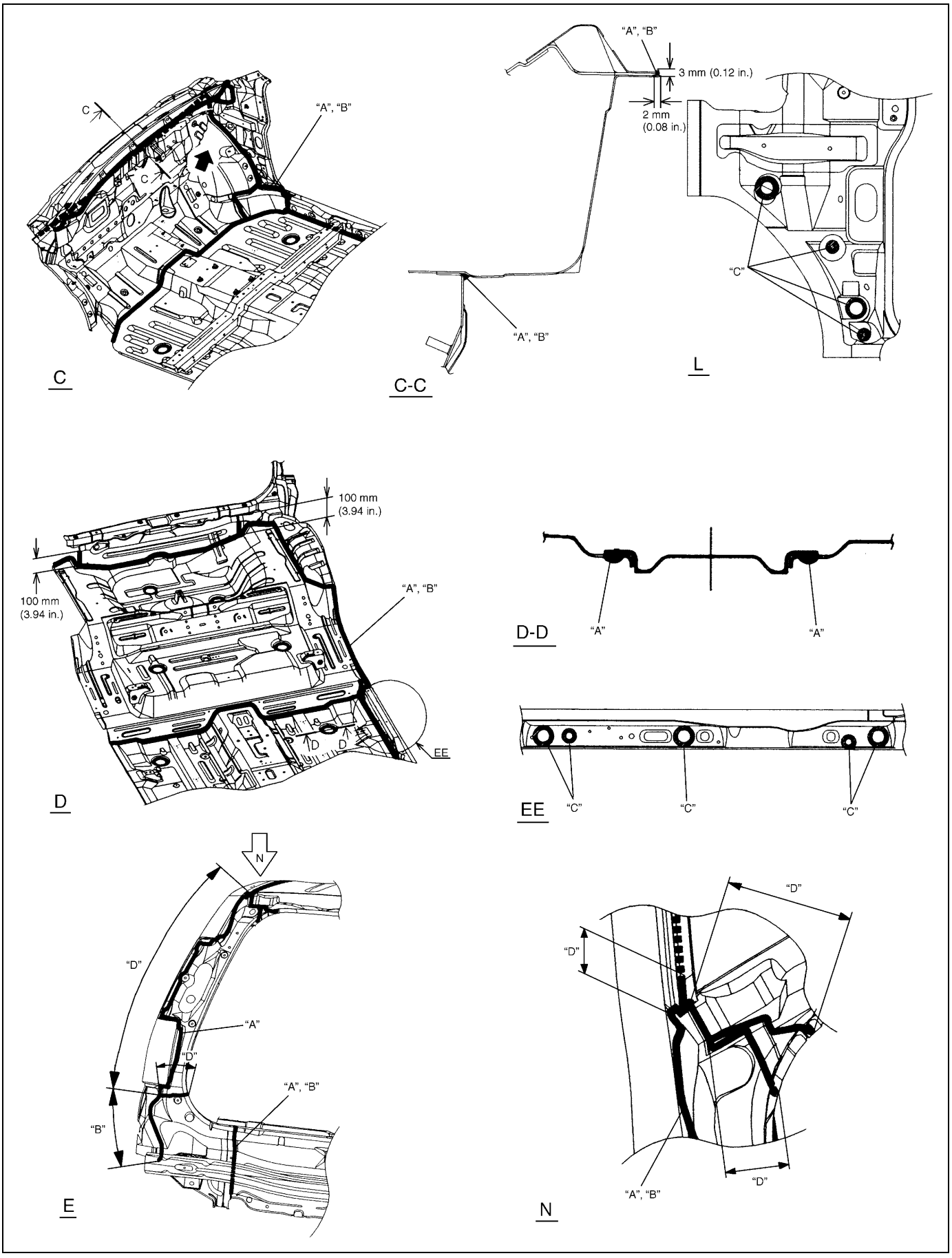

"A" : Apply sealant	"C" : Do not apply sealant
"B" : Smooth out sealant with a brush	"D" : Wipe off excess sealant after application

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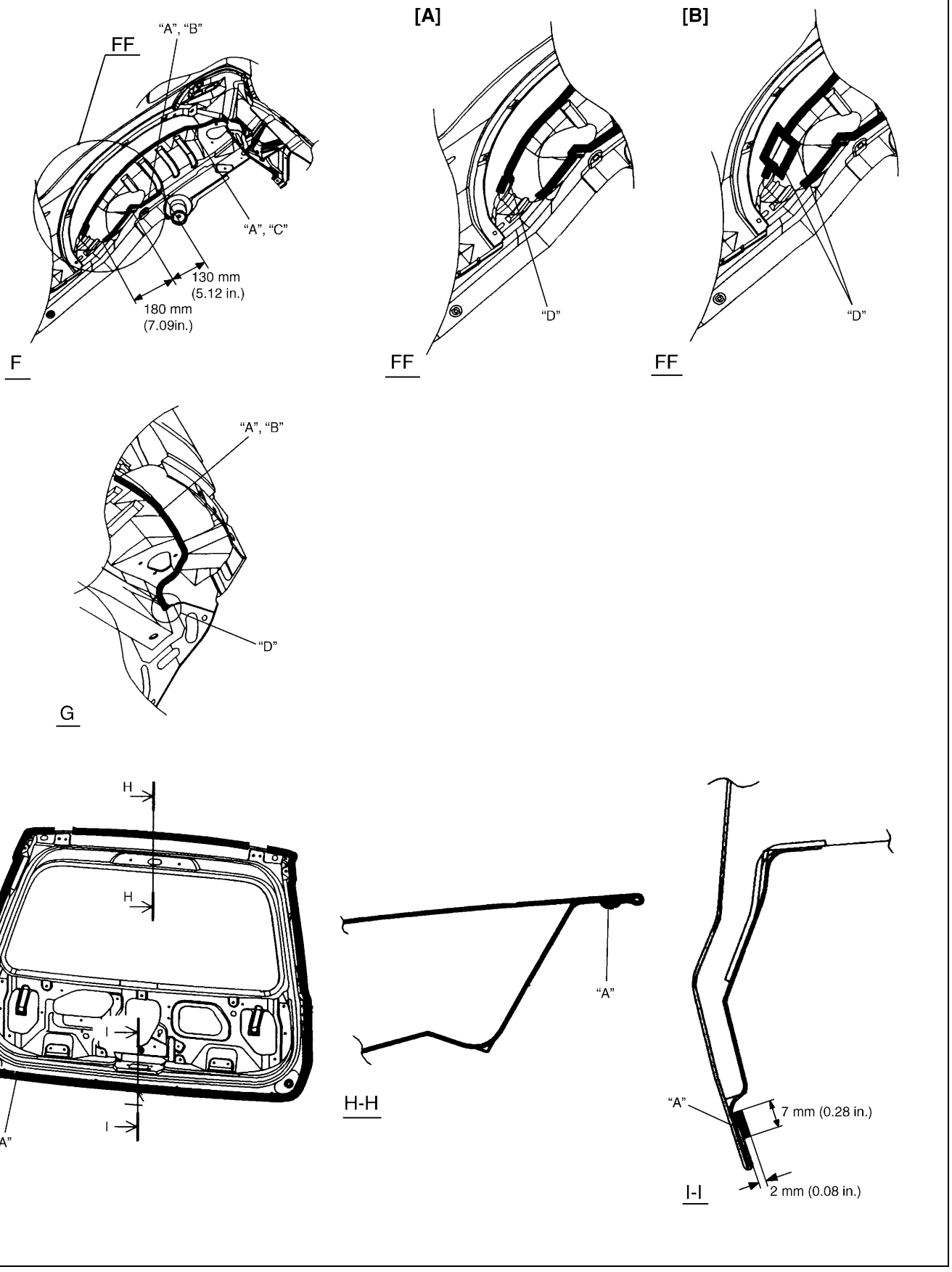

[A] : 3 door model	"A" : Apply sealant	"C" : Smooth out sealant with a brush
[B] : 5 door model	"B" : Wipe off excess sealant after application	"D" : Fill gap/hole with sealant

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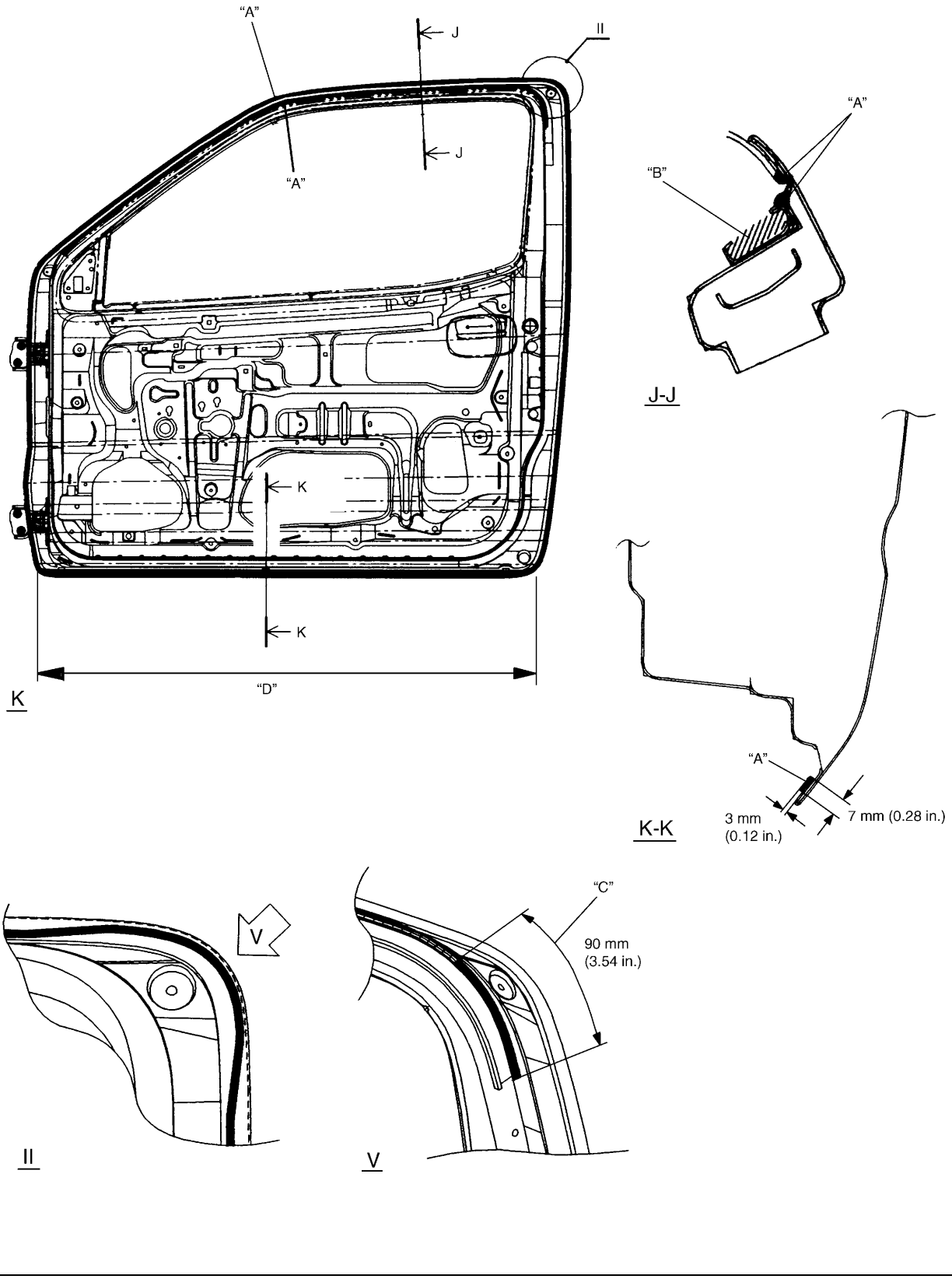

[A] : 3 door model	"C" : Wipe off excess sealant after application
"A" : Apply sealant	"D" : Never fill up drain holes with sealant
"B" : Be free from swell and protruded on hatched part	

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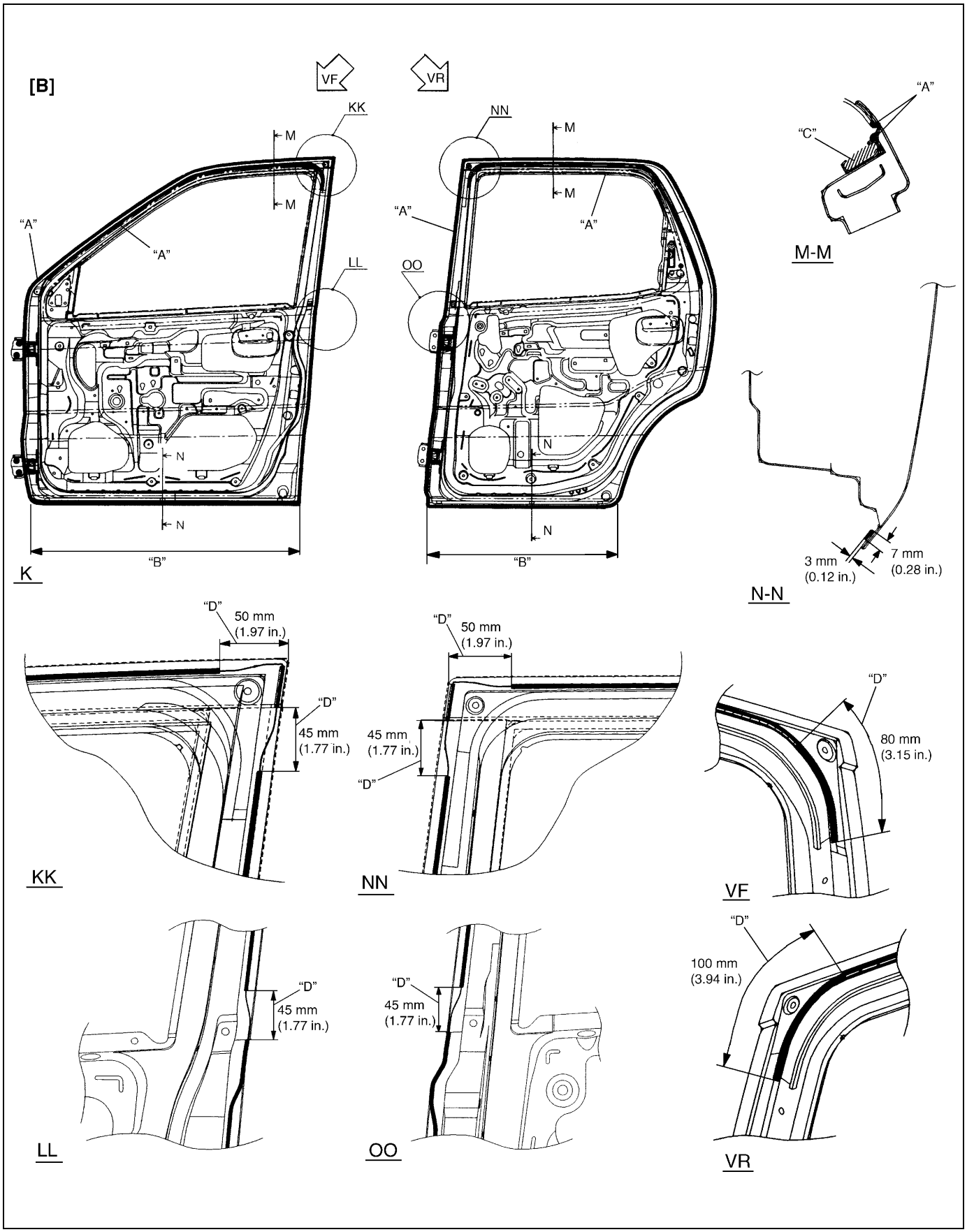

[B] : 5 door model	"C" : Be free from swell and protruded on hatched part
"A" : Apply sealant	"D" : Wipe off excess sealant after application
"B" : Never fill up drain holes with sealant	

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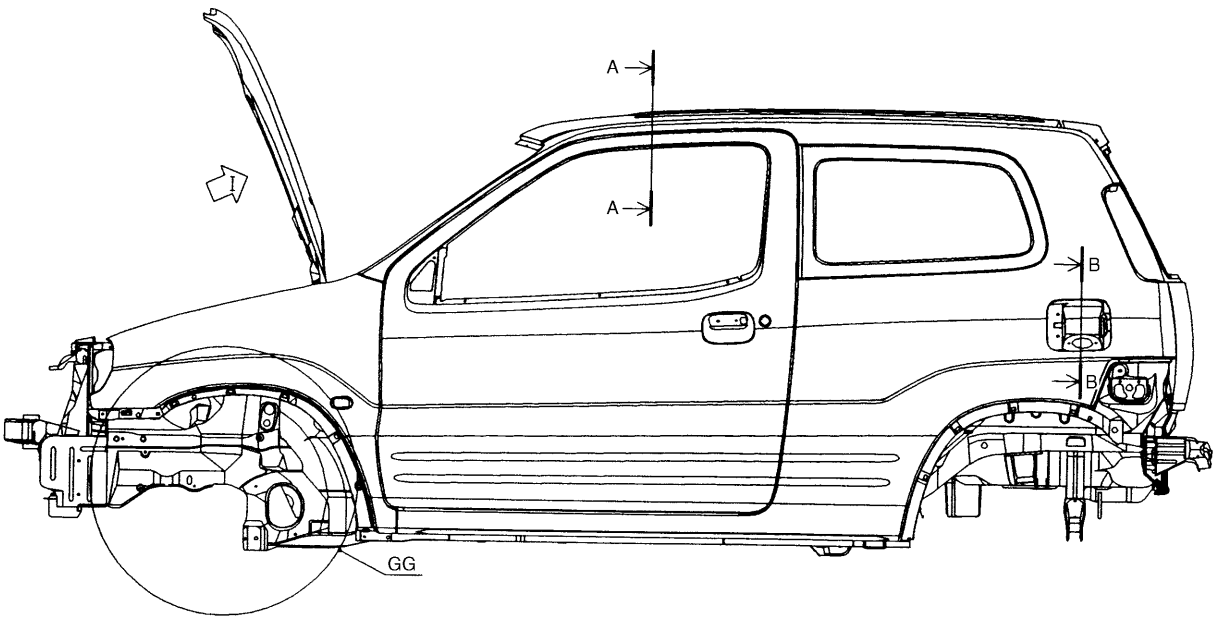
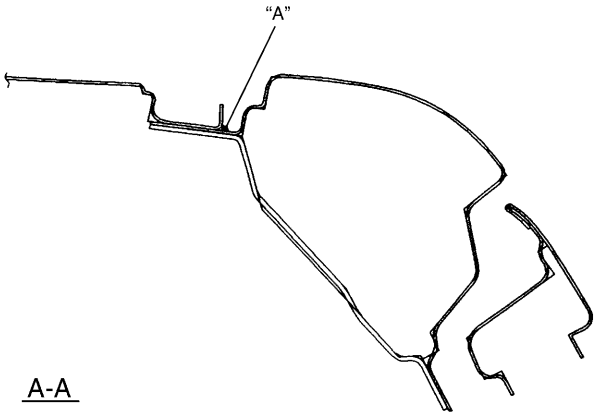
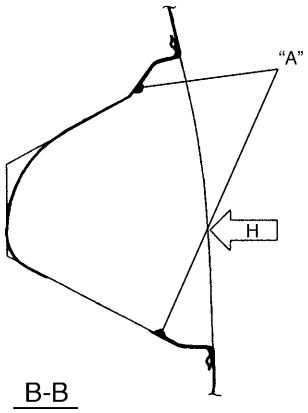
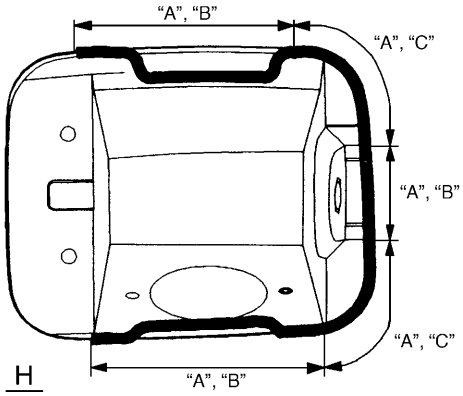




A-A



B-B



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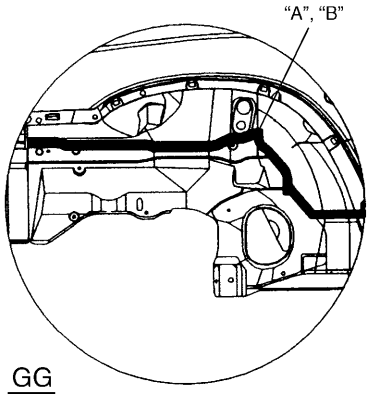

GG

"A" :	Apply sealant
"B" :	Smooth out sealant with a brush
"C" :	Wipe off excess sealant after application

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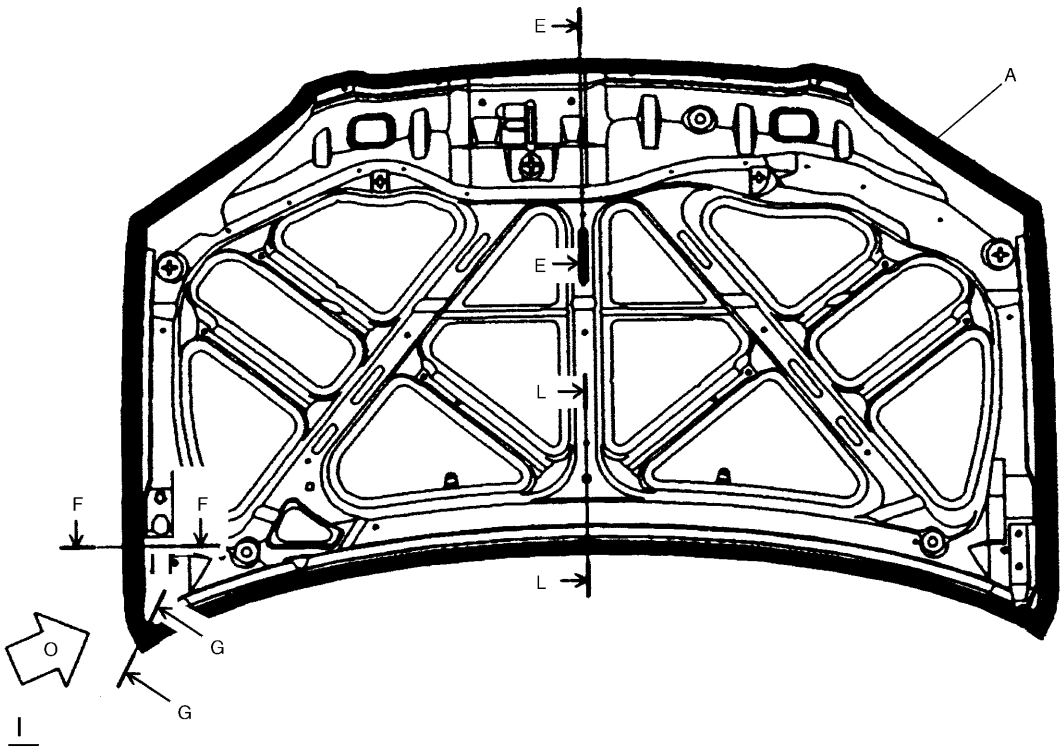
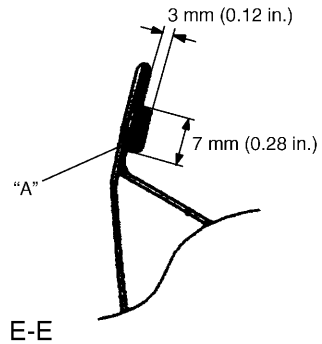
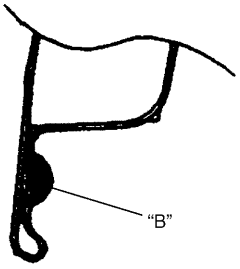


I

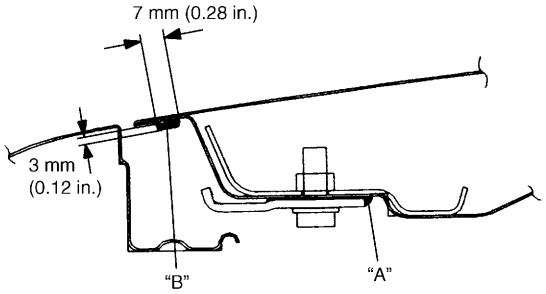


E-E

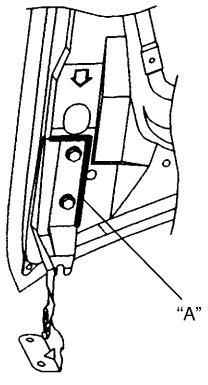
G-G



L-L



F-F



O

"A" :	Apply sealant
"B" :	Apply sealant so that top of flange covered up certainly

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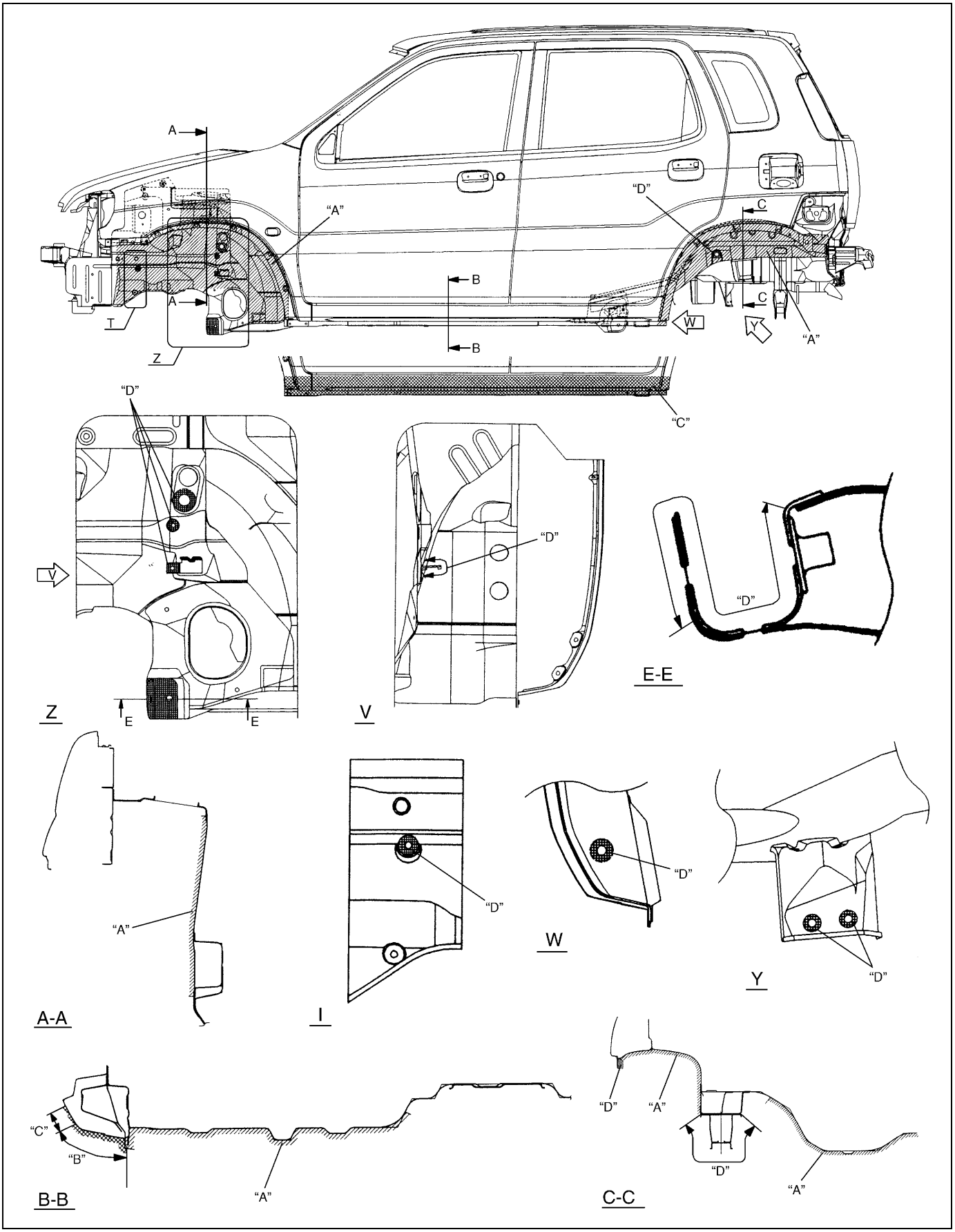
UNDER COATING APPLICATION AREAS



"A" : Apply undercoating (PCV, 400 µm or more)	"C" : Apply anti-chip coat (300 µm or more)
"B" : Apply anti-chip coat (100 µm or more)	"D" : Do not apply undercoating

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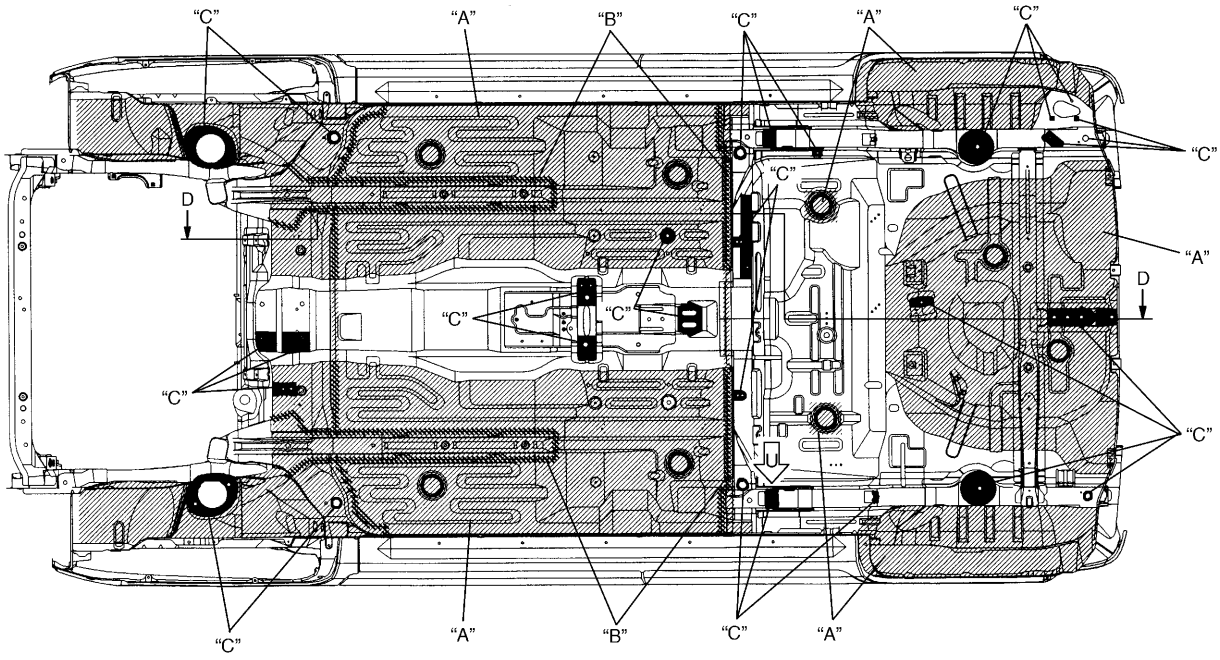
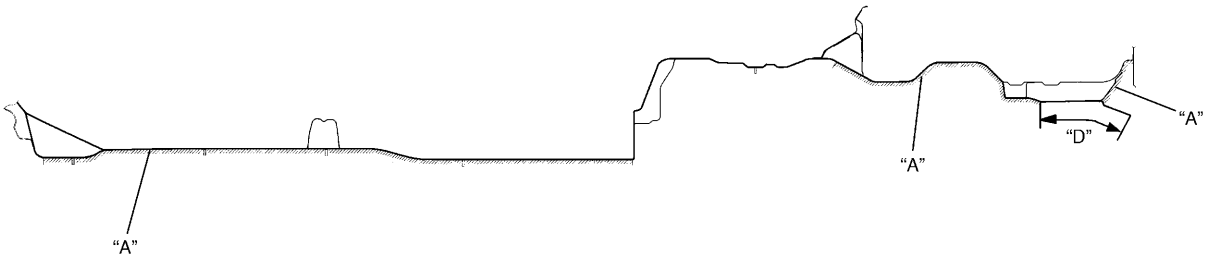
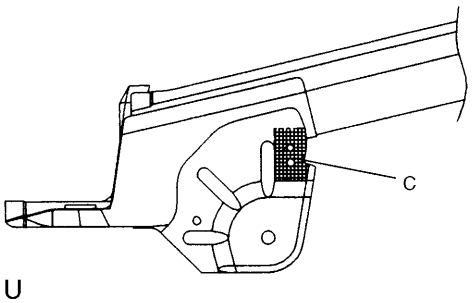




D-D



U

"A" :	Apply undercoating (PCV, 400 µm or more)
"B" :	Apply undercoating (PCV, 600 µm or more)
"C" :	Do not apply undercoating

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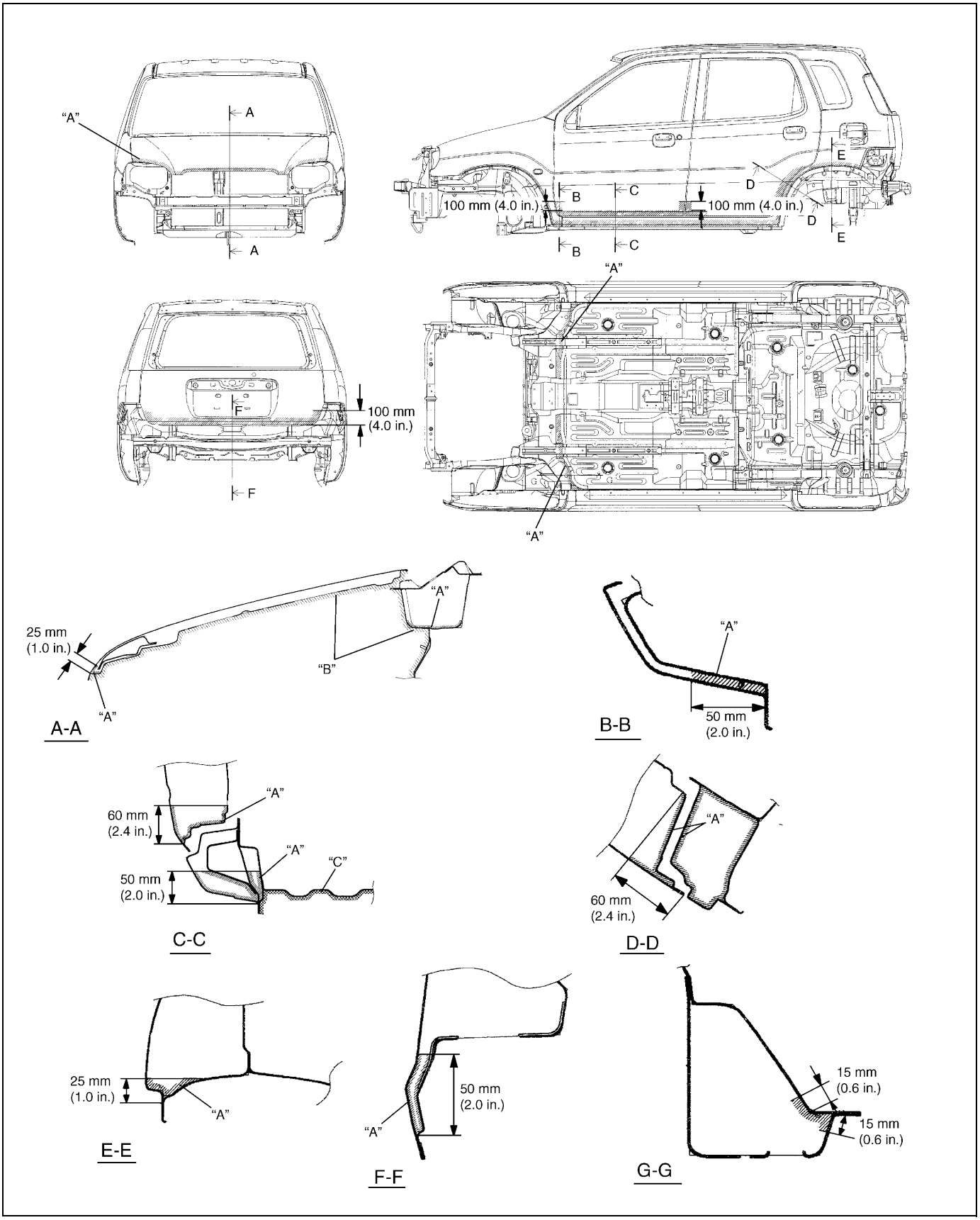
ANTI-CORROSION COMPOUND APPLICATION AREA



"A" :	Apply rust proof wax (hot wax 50 µm or more)
"B" :	Apply rust proof wax (low viscosity wax 10 µm or more)
"C" :	Apply rust proof wax (high viscosity wax 50 µm or more)

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PLASTIC PARTS FINISHING

Paintable plastic parts are ABS plastic parts.

Painting

Rigid or hand ABS plastic needs no primer coating.
General acrylic lacquers can be painted properly over hard ABS plastic in terms of adherence.

1) Use cleaning solvent for paint finish to wash each part.
2) Apply conventional acrylic color lacquer to part surface.
3) Follow lacquer directions for required drying time. (Proper drying temperature range is 60 – 70 °C (140 – 158 °F)).

Reference

Plastic parts employ not only ABS (Acrylonitrile Butadiene Styrene) plastic but also polypropylene, vinyl, or the like plastic. Burning test method to identify ABS plastic is described below.

1) Use a sharp blade to cut off a plastic sliver from the part at its hidden backside.
2) Hold sliver with pincers and set it on fire.
3) Carefully observe condition of the burning plastic.
4) ABS plastic must raise readily distinguishable back smoke while burning with its residue suspended in air temporarily.
5) Polypropylene must raise no readily distinguishable smoke while burning.

REQUIRED SERVICE MATERIAL

Material	Recommended SUZUKI product	Use
Lithium grease	SUZUKI SUPER GREASE A (99000-25010)	• Window regulator • Door hinge
Sealant	SUZUKI BOND No. 1215 (99000-31110)	• Hood hinge • Door hinge

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SECTION 10

RESTRAINT SYSTEM

WARNING:

For vehicles equipped with Supplemental Restraint (Air Bag) System with seat belt pretensioner:

- **Service on or around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **The procedures in this section must be followed in the order listed to disable the air bag system temporarily and prevent false diagnostic trouble codes from setting. Failure to follow procedures could result in possible activation of the air bag system, personal injury or otherwise unneeded air bag system repairs.**

CAUTION:

When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread-locking compound, will be called out. The correct torque value must be used when installing fasteners that require it. If the above procedures are not followed, parts or system damage could result.

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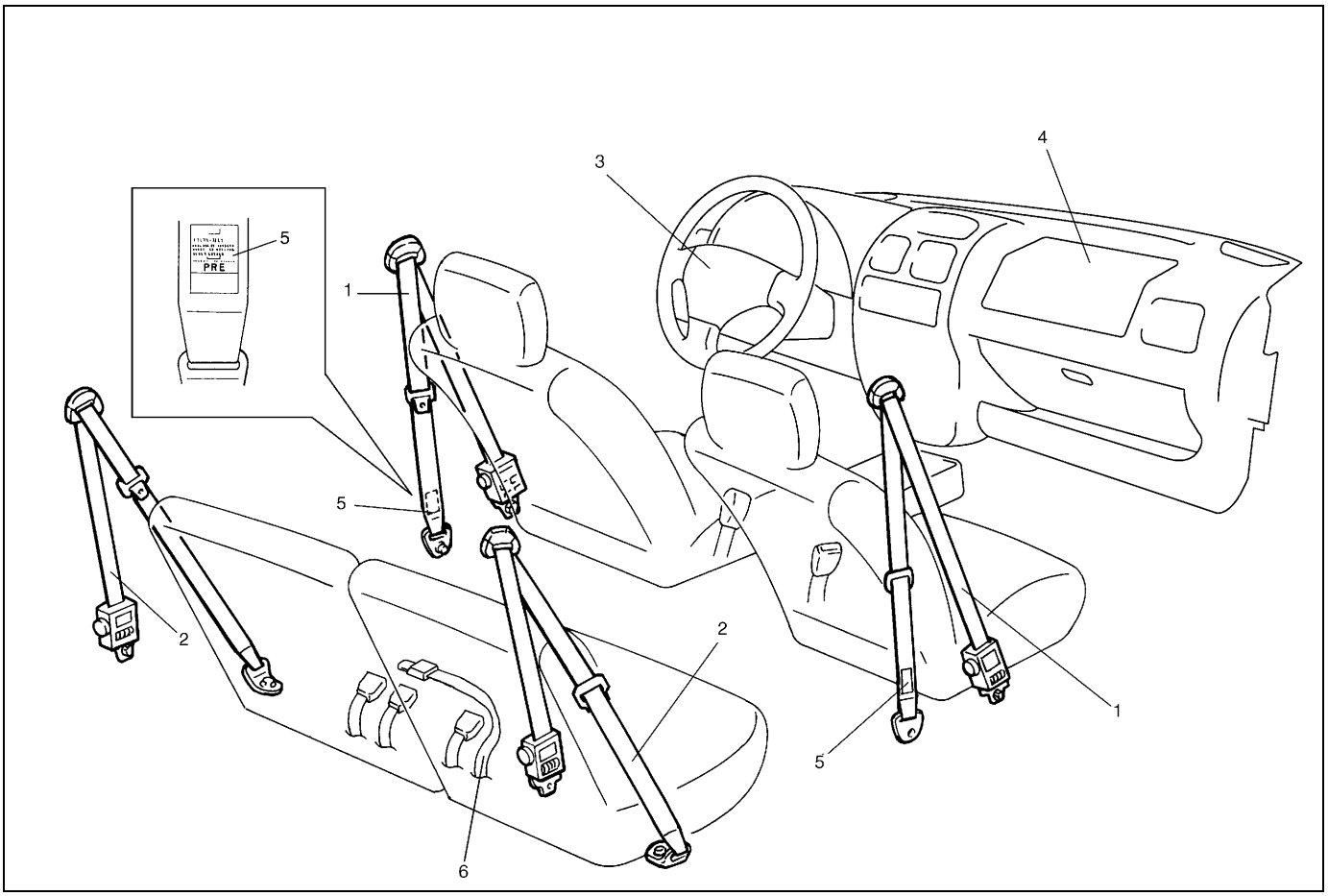
GENERAL DESCRIPTION



1. Front seat belt	4. Passenger air bag (if equipped)
2. Rear seat belt	5. Label (for seat belt with pretensioner)
3. Driver air bag (if equipped)	6. Rear center seat belt

Seat Belt with ELR

The seat belt with emergency locking retractor (ELR) is designed so that it locks immediately (to prevent the webbing from being pulled out of the retractor any further) when any of the following items is detected as exceeding each set value;

- speed at which the webbing is pulled out of the retractor,
- acceleration or deceleration of the vehicle speed, and
- inclination.

Seat Belt with A-ELR

The automatic and emergency locking retractor (A-ELR) works as an Emergency Locking Retractor (ELR) till its webbing is pulled all the way out and then on as an Automatic Locking Retractor (ALR) till it is retracted fully.
ALR: Automatically locks when the webbing is pulled out from the retractor and allowed to retract even a little. Then the webbing can not be pulled out any further, unless it is wound all the way back into the retractor, which releases the lock and allows the webbing to be pulled out.

Seat Belt with ELR and Pretensioner

The seat belt with ELR and a pretensioner has a pretensioner mechanism which operates in linkage with the air bag in addition to the above described ELR. The pretensioner takes up the sag of the seat belt in occurrence of a front collision with an impact larger than a certain set value, thereby enhancing restraint performance.

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Driver and Front Passenger Air Bags and Seat Belt Pretensioners

With the air bag system which includes air bags for both the driver's and passenger's sides as well as the seat belt pretensioners, the pretensioner takes up the sag of the seat belt, the driver air bag (inflator) module is deployed from the center of the steering column and the passenger air bag (inflator) module from the top of the instrument panel in front of the front passenger seat in occurrence of a front collision with an impact larger than a certain set value to supplement protection offered by the driver and front passenger seat belts.

SYSTEM SPECIFICATION

	Type 1	Type 2	Type 3
Front seat	• Seat belt with ELR	• Driver air bag • Seat belt with ELR and pretensioner	• Driver and front passenger air bags • Seat belt wit ELR and pretensioner
Rear seat	• Seat belt with A-ELR (right and left) • Seat belt (center)	• Seat belt with A-ELR (right and left) • Seat belt (center)	• Seat belt with A-ELR (right and left) • Seat belt (center)

SEAT BELT PRETENSIONER (IF EQUIPPED)

Some seat belts of the driver and front passenger seats are provided with a pretensioner as an optional function unit. The pretensioner is incorporated in retractor assembly and controlled by SDM as one of air bag system components. It will be activated at the same time as the air bag when an impact at the front of vehicle exceeds the specified value.

When servicing seat belt (retractor assembly) with pretensioner, be sure to observe all WARNINGS and CAUTIONS in this section and "SERVICE PRECAUTIONS" of "ON-VEHICLE SERVICE" in Section 10B

CAUTION:

Do not reuse the seat belt pretensioner (retractor assembly) that has operated but replace it with a new one as an assembly. For checking procedure of its operation, refer to "SERVICE PRECAUTIONS" of "ON-VEHICLE SERVICE" in Section 10B.

DIAGNOSIS

For diagnosis of air bag system (including in seat belt pretensioner), refer to Section 10B.

INSPECTION AND REPAIR REQUIRED AFTER ACCIDENT

After an accident, whether the seat belt pretensioner has been activated or not, be sure to perform checks and repairs described on "REPAIRS AND INSPECTIONS REQUIRED AFTER ACCIDENT" under "DIAGNOSIS" in Section 10B.

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ON-VEHICLE SERVICE

SERVICE PRECAUTIONS

SERVICE AND DIAGNOSIS

WARNING:
If replacing seat belt is necessary, replace buckle and ELR (or webbing) together as a set. This is for the reason of ensuring locking of tongue plate with buckle.
If these parts are replaced individually, such a locking condition may become unreliable. For this reason, SUZUKI will supply only the spare buckle and ELR (or webbing) in a set part.

Before servicing or replacing seat belts, refer to following precautionary items.
- Seat belts should be normal relative to strap retractor and buckle portions.
- Keep sharp edges and damaging objects away from belts.
- Avoid bending or damaging any portion of belt buckle or latch plate.
- Do not bleach or dye belt webbing. (Use only mild soap and lukewarm water to clean it.)
- When installing a seat belt anchor bolt, it should be tightened by hand at first to prevent cross-threading and then to specified torque.
- Do not attempt any repairs on retractor mechanisms or retractor covers. Replace defective assemblies with new replacement parts.
- Keep belts dry and clean at all times.
- If there exist any parts in question, replace such parts.
- Replace belts whose webbing is cut or otherwise damaged.
- Do not put anything into trim panel opening which seat belt webbing passes through.

For Seat Belt with Pretensioner

Refer to “SERVICE AND DIAGNOSIS” of “SERVICE PRECAUTIONS” under “ON-VEHICLE SERVICE” in Section 10B.

WARNING:
When performing service on or around air bag system components or air bag system wiring, disable the air bag system. Refer to “DISABLING AIR BAG SYSTEM” of “SERVICE PRECAUTIONS” under “ON-VEHICLE SERVICE” in Section 10B.
Failure to follow procedures could result in possible air bag activation, personal injury or unneeded air bag system repairs.

DISABLING AIR BAG SYSTEM

Refer to “DISABLING AIR BAG SYSTEM” of “SERVICE PRECAUTIONS” under “ON-VEHICLE SERVICE” in Section 10B.

ENABLING AIR BAG SYSTEM

Refer to “ENABLING AIR BAG SYSTEM” of “SERVICE PRECAUTIONS” under “ON-VEHICLE SERVICE” in Section 10B.

HANDLING AND STORAGE

Refer to “HANDLING AND STORAGE” of “SERVICE PRECAUTIONS” under “ON-VEHICLE SERVICE” in Section 10B.

DISPOSAL

Refer to “DISPOSAL” of “SERVICE PRECAUTIONS” under “ON-VEHICLE SERVICE” in Section 10B.

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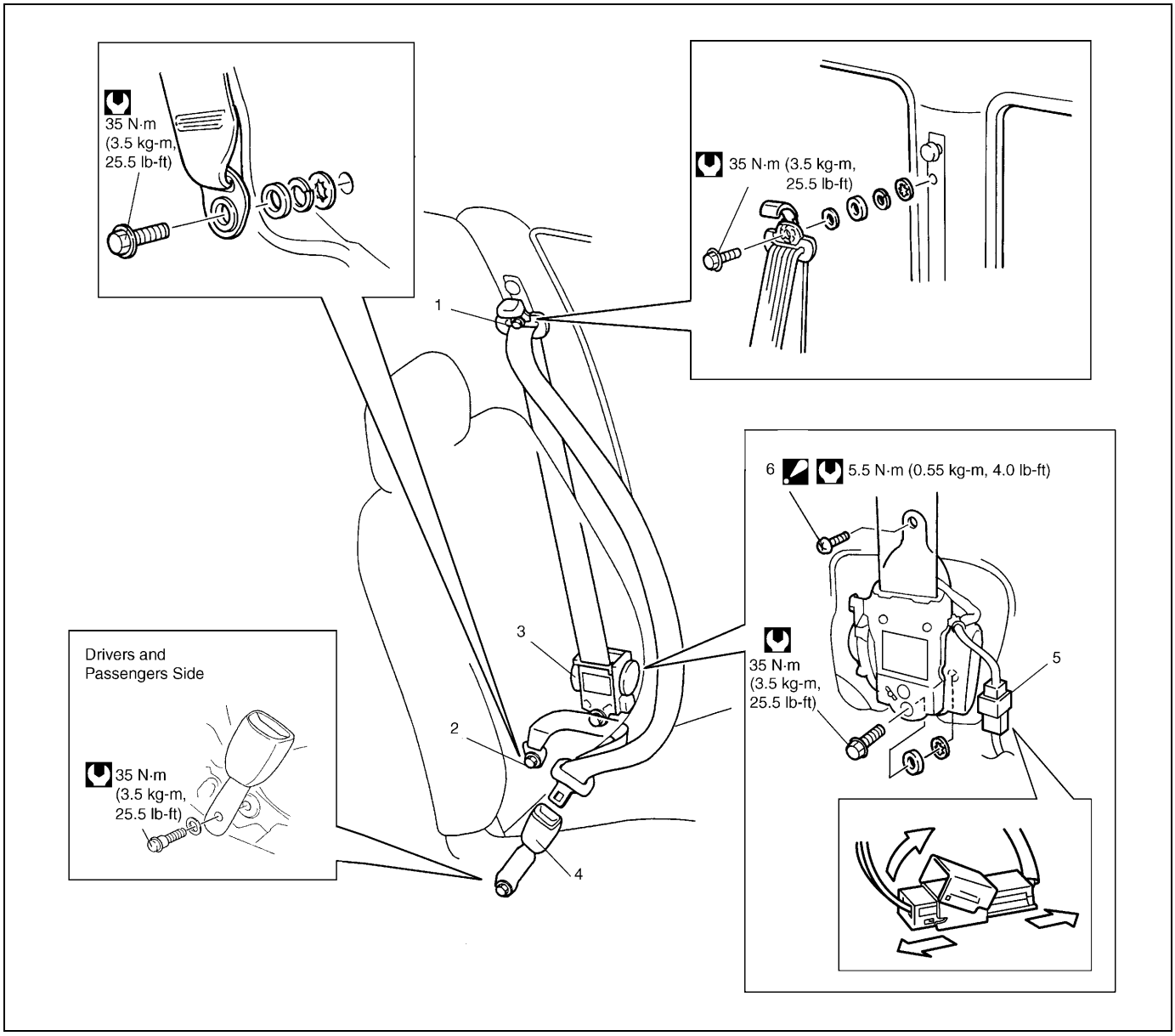
FRONT SEAT BELT

WARNING:

- **Never attempt to disassemble or repair the seat belt pretensioner (retractor assembly). If any abnormality is found, be sure to replace it with new one as an assembly.**
- **Be sure to read "SERVICE PRECAUTIONS", before starting to work and observe every precaution during work. Neglecting them may result in personal injury or unactivation of the seat belt pretensioner when necessary.**



1. Upper anchor	4. Buckle	Tightening torque
2. Lower anchor	5. Yellow connector (for seat belt pretensioner) (if equipped)	
3. Retractor assembly	6. Retractor assembly upper mounting bolt : After tightening lower bolt, tightening upper bolt	

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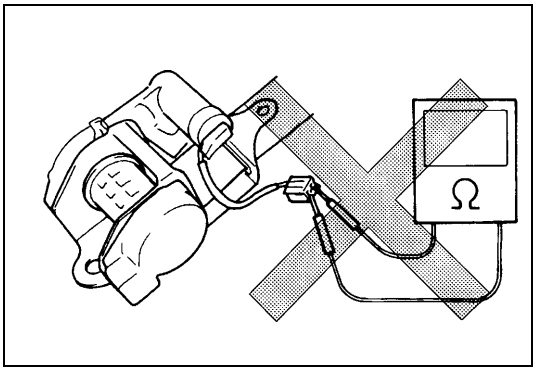
REMOVAL

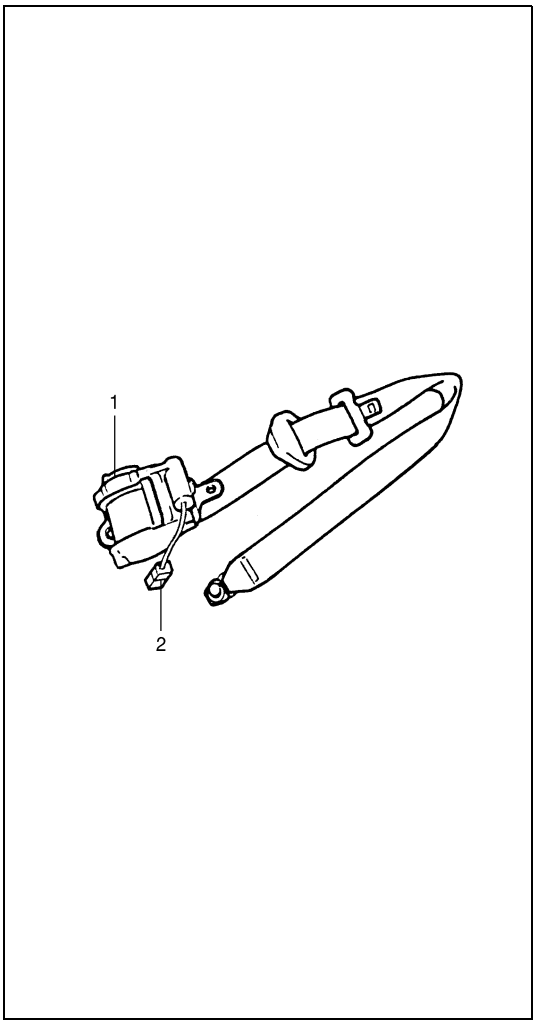
1) Disconnect negative battery cable at battery.
2) Disable air bag system. Refer to “DISABLING AIR BAG SYSTEM” of “SERVICE PRECAUTIONS” under “ON-VEHICLE SERVICE” in Section 10B.
3) Remove center pillar lower trim.
4) Disconnect Yellow connector for seat belt pretensioner.
   a) Release locking of lock lever.
   b) After unlocked, disconnect to connector.
5) Remove front seat belts from the vehicle.

INSPECTION



WARNING:
Never measure resistance of pretensioner or disassemble it. Otherwise, personal injury may result.

CAUTION:
If seat belt pretensioner (retractor assembly) was dropped from a height of 30 cm (1 ft) or more, it should be replaced.



Seat belts and attaching parts can affect the vital components and systems of a vehicle.
Therefore, they should be inspected carefully and replaced with genuine parts only.

- Seat belt
  Its webbing or strap should be free from damage.
- Retractor assembly
  It should lock webbing when pulled quickly.
  The front seat belt retractor assembly (1) should pass the above inspection and should lock webbing even when tilted (approx. 15°) toward the fore and aft or right and left directions.
  Check retractor assembly (1) with seat belt pretensioner appearance visually for following symptoms and if any one of them is applicable, replace it with a new one as an assembly.
- Pretensioner has activated.
- There is a crack in seat belt pretensioner (retractor assembly).
- Wire harness or connector (2) is damaged.
- Seat belt pretensioner (retractor assembly) is damaged or a strong impact (e.g., dropping) was applied to it.
- Anchor bolt
  Anchor bolts should be torqued to specification.
- Belt latch
  It should be secure when latched.

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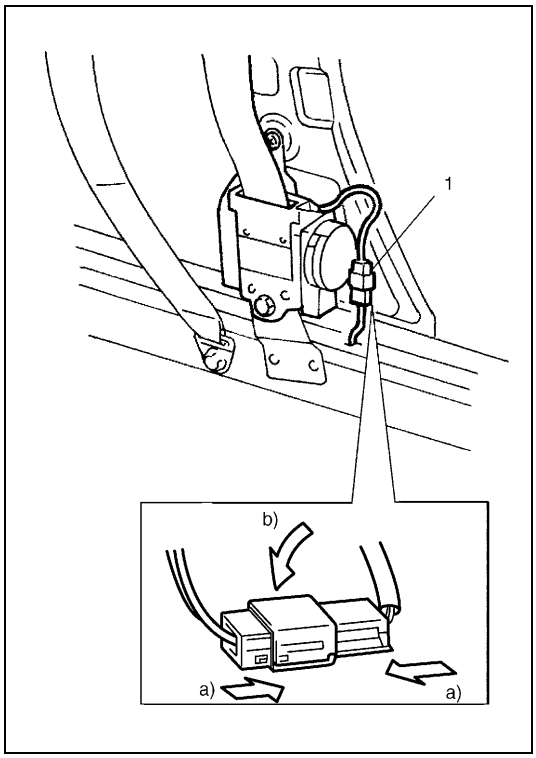
INSTALLATION

Install in reverse order of removal, noting the following.

- Seat belt anchor bolts should have an unified fine thread (7/16-20 UNF). Under no circumstances should any different sized or metric screw threads be used.



- Connect Yellow connector (1) for seat belt pretensioner securely and fit seat belt pretensioner connector onto body.

a) Connect connector
b) Lock connector with lock lever

- Enable air bag system. Refer to “ENABLING AIR BAG SYSTEM” under “SERVICE PRECAUTIONS” in Section 10B.

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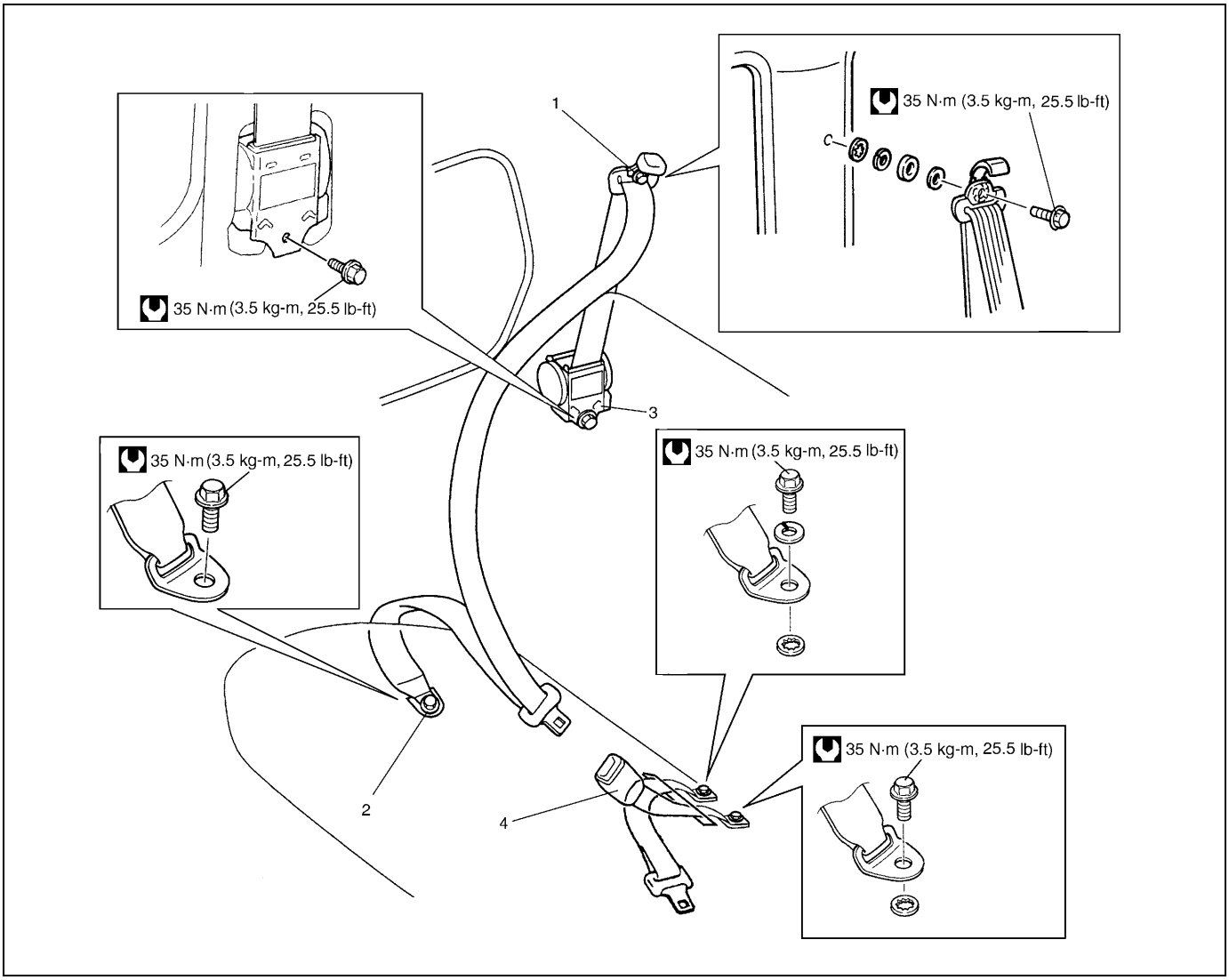
REAR SEAT BELT

WARNING:
Be sure to read "SERVICE PRECAUTIONS" before starting to work and observe every precaution during work.



1. Upper anchor	4. Buckle
2. Lower anchor	Tightening torque
3. Retractor assembly	

REMOVAL

Remove rear seat belts as shown in figure.

INSPECTION

Check the rear seat belt in the same way as "INSPECTION" of "FRONT SEAT BELT".

INSTALLATION

Install the rear seat belt observing the same precautions as "INSTALLATION" of "FRONT SEAT BELT".

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SECTION 10B

AIR BAG SYSTEM

WARNING:

- **Service on or around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Please observe all WARNINGS and "Service Precautions" under "On-Vehicle Service" in this section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintended activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **The procedures in this section must be followed in the order listed to disable the air bag system temporarily and prevent false diagnostic trouble codes from setting. Failure to follow procedures could result in possible activation of the air bag system, personal injury or otherwise unneeded air bag system repairs.**

CAUTION:

When fasteners are removed, always reinstall them at the same location from which they were removed. If a fastener needs to be replaced, use the correct part number fastener for that application. If the correct part number fastener is not available, a fastener of equal size and strength (or stronger) may be used. Fasteners that are not reused, and those requiring thread-locking compound, will be called out. The correct torque value must be used when installing fasteners that require it. If the above conditions are not followed, parts or system damage could result.

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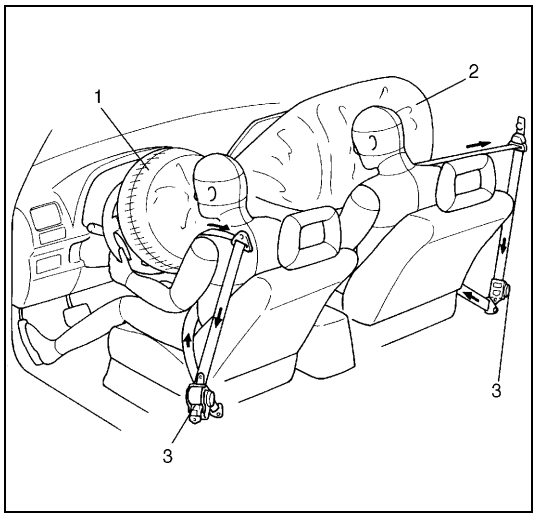
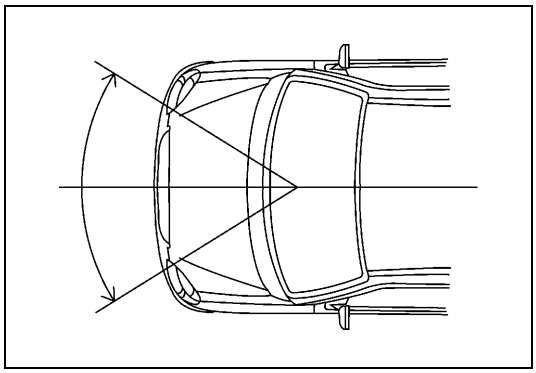
GENERAL DESCRIPTION



With the air bag system which includes air bags for both the driver's and passenger's sides as well as the seat belt pretensioners (if equipped), the sag of the seat belt is taken up (for seat belt with pretensioner), the driver air bag (inflator) module is deployed from the center of the steering column and the passenger air bag (inflator) module from the top of the instrument panel in front of the front passenger seat in occurrence of a front collision with an impact larger than a certain set value to supplement protection offered by the driver and front passenger seat belts.

1. Driver side air bag
2. Passenger side air bag
3. Seat belt pretensioner (if equipped)



The air bag system is designed to activate only in severe frontal collisions. It is not designed to activate in rear impacts, side impacts, rollovers, or minor frontal collisions, since it would offer no protection in those types of accidents.

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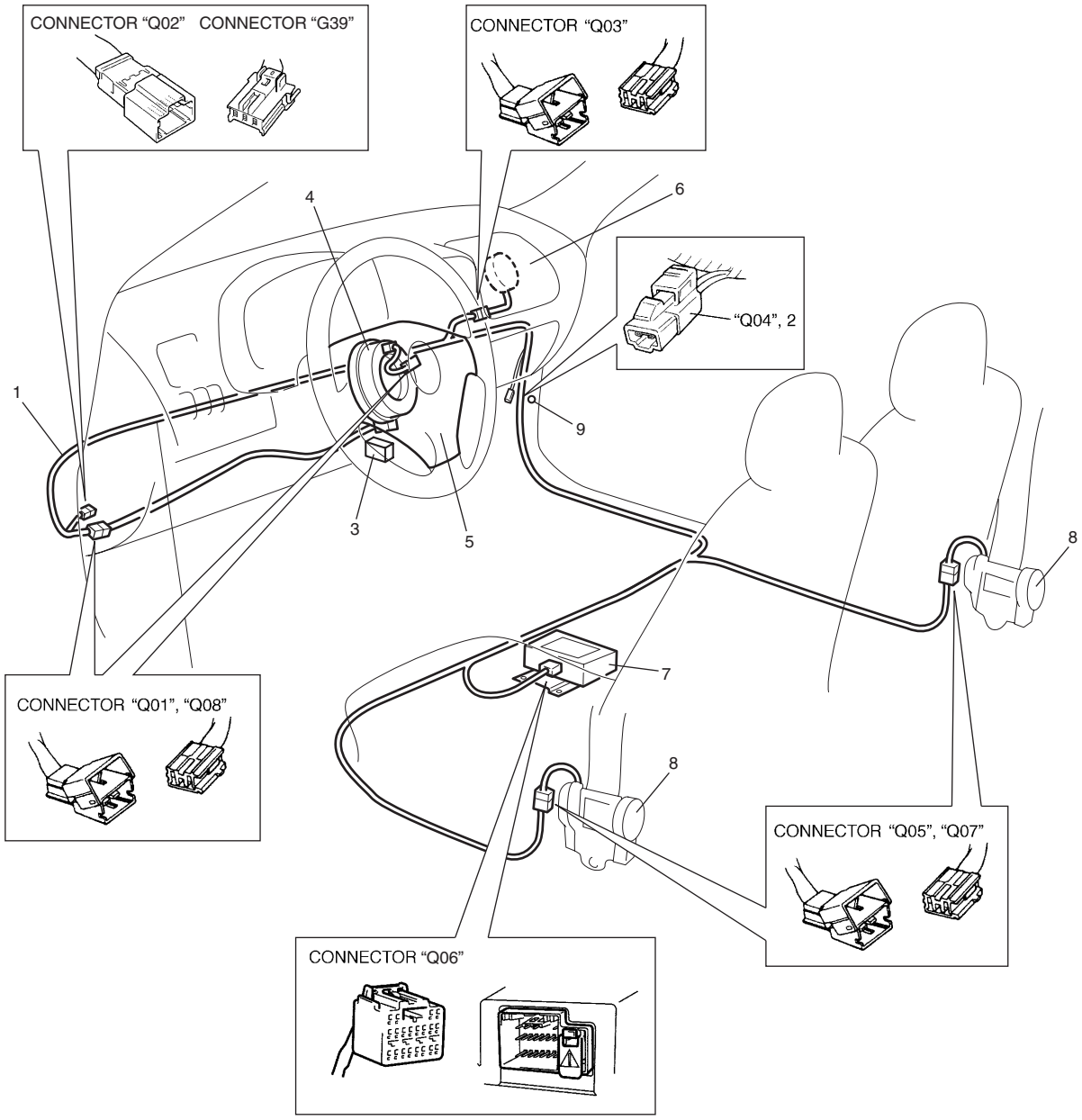
SYSTEM COMPONENTS AND WIRING LOCATION VIEW AND CONNECTORS



1. Air bag harness	6. Passenger air bag (inflator) module
2. "Air bag" monitor coupler	7. SDM
3. DLC	8. Seat belt pretensioner (retractor assembly) (if equipped)
4. Contact coil assembly	9. Ground for air bag system
5. Driver air bag (inflator) module	

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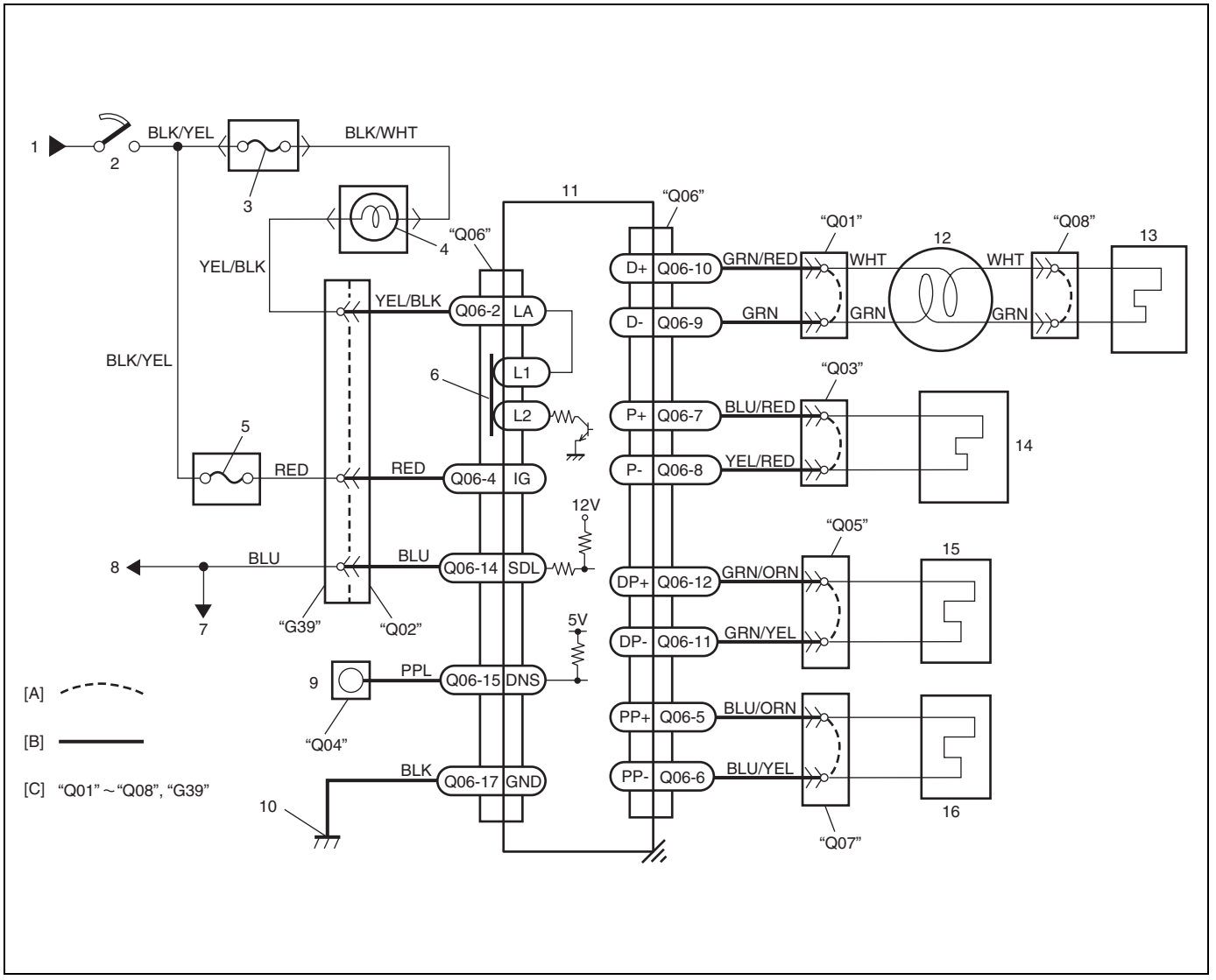
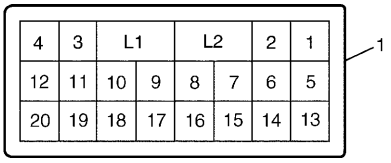
SYSTEM WIRING DIAGRAM



[A]: Shorting bar	5. "AIR BAG" fuse	12. Contact coil assembly
[B]: Air bag harness	6. Connection detection pin	13. Driver air bag (inflator) module
[C]: Connector	7. To ECM, TCM (if equipped) and ABS control module (if equipped)	14. Passenger air bag (inflator) module
1. From main fuse	8. To data link connector (DLC)	15. Driver seat belt pretensioner (if equipped)
2. Ignition switch	9. "AIR BAG" monitor coupler	16. Passenger seat belt pretensioner (if equipped)
3. "IG METER" fuse	10. Ground for air bag system	
4. "AIR BAG" warning lamp in combination meter	11. SDM	

TERMINAL ARRANGEMENT OF SDM (VIEWED FROM HARNESS SIDE)



1. CONNECTOR "Q06" (SDM CONNECTOR)

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CONNECTOR “Q06” (SDM connector)

TERMINAL	CIRCUIT		TERMINAL	CIRCUIT	
Q06-1	–		Q06-11	Driver pretensioner (if equipped)	Low
Q06-2	“AIR BAG” warning lamp		Q06-12		High
Q06-3	–		Q06-13	–	
Q06-4	Ignition switch (power source)		Q06-14	Data link connector (DLC)	
Q06-5	Passenger pretensioner (if equipped)	High	Q06-15	Diagnosis switch	
Q06-6		Low	Q06-16	–	
Q06-7	Passenger air bag (inflator) module	High	Q06-17	Ground	
Q06-8		Low	Q06-18	–	
Q06-9	Driver air bag (inflator) module	Low	Q06-19	–	
Q06-10		High	Q06-20	–	

DIAGNOSIS

WARNING:

To avoid deployment when troubleshooting the air bag system, do not use electrical test equipment such as a battery powered or AC powered voltmeter, ohmmeter, etc., or any type of electrical equipment other than that specified in this manual. Do not use a non-powered probe type tester. Instructions in this manual must be followed carefully, otherwise personal injury may result.

DIAGNOSTIC TROUBLE CODE (DTC)

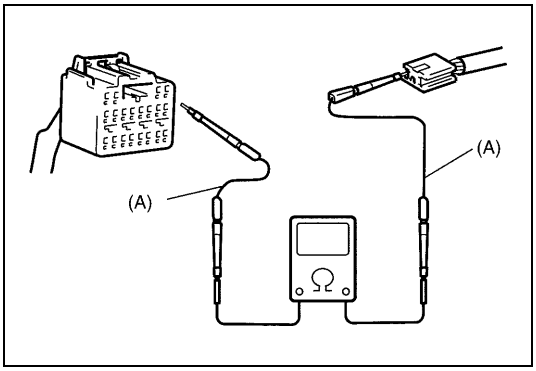
The AIR BAG DIAGNOSTIC SYSTEM CHECK must always be the starting point of any air bag system diagnosis. The AIR BAG DIAGNOSTIC SYSTEM CHECK checks for proper “AIR BAG” warning lamp operation and checks for air bag diagnostic trouble codes (DTCs) using on-board diagnosis function or SUZUKI scan tool.

USE OF SPECIAL TOOL

WARNING:

To avoid deployment when troubleshooting the air bag system, do not use electrical test equipment such as a battery powered or AC powered voltmeter, ohmmeter, etc., or any type of electrical equipment other than that specified in this manual. Do not use a non-powered probe type tester. Instructions in this manual must be followed carefully, otherwise personal injury may result.

You should be familiar with the tools listed in this section under the heading SPECIAL TOOLS. You should be able to measure voltage and resistance. You should be familiar with proper use of a scan tool such as Air Bag Driver/Passenger Load Tool, Connector Test Adapter Kit and the Digital Multimeter.



Special tool
(A) : 09932-76010 (Connector Test Adapter Kit)

This must be used whenever a diagnostic procedure requests checking or probing a terminal.
Using the appropriate adapter in the special tool will ensure that no damage to the terminal will occur from the multimeter probe, such as spreading or bending.

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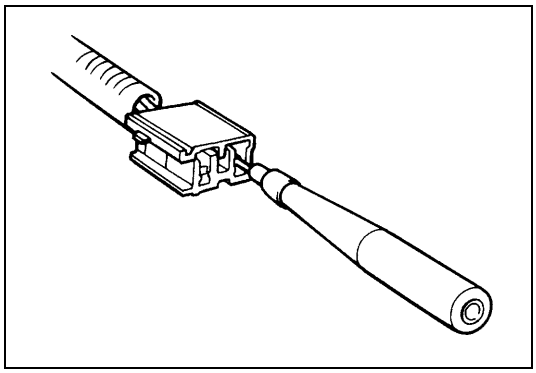
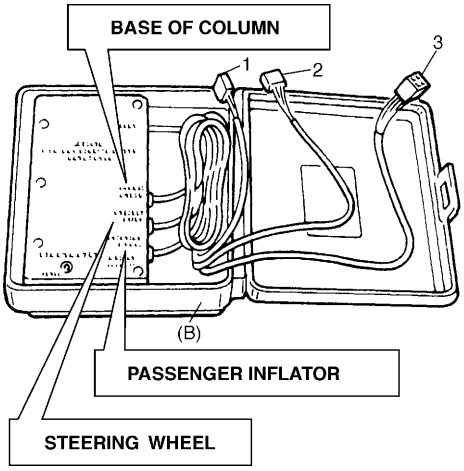


The adapter will also give an idea of whether contact tension is sufficient, helping to find an open or intermittent open due to poor terminal contact.



Special tool
(B) : 09932-75010 (Air Bag Driver/Passenger Load Tool)

This tool is used only when called for in this section. It is used as a diagnostic aid and safety device to prevent inadvertent air bag (inflator) module deployment.
The load tool has three connectors attached to its case which are electrically functional and serve as resistive load substitutions.
No more than two connectors are used at any time.

One of connectors (“STEERING WHEEL”) is used to substitute the load of followings.

- driver air bag (inflator) module when it is connected at the top of the column to the contact coil assembly.
- passenger air bag (inflator) module when it is connected to the air bag harness connector for passenger air bag (inflator) module.

Another connector (“BASE OF COLUMN”) is used to substitute the load of the driver air bag (inflator) module and the contact coil assembly when it is connected at the base of the column to the air bag wire harness.
The third connector (“PASSENGER INFLATOR”) is not used.

By substituting the resistance of the load tool when called for, a determination can be made as to whether an inflator circuit component is causing system malfunction and which component is causing the malfunction.
The load tool should be used only when specifically called for in the diagnostic procedures.

1. Connector for contact coil and driver air bag (inflator) module (Located near the base of the steering column)
2. Connector for driver, passenger air bag (inflator) module and driver and passenger seat belt pretensioners
3. Not used

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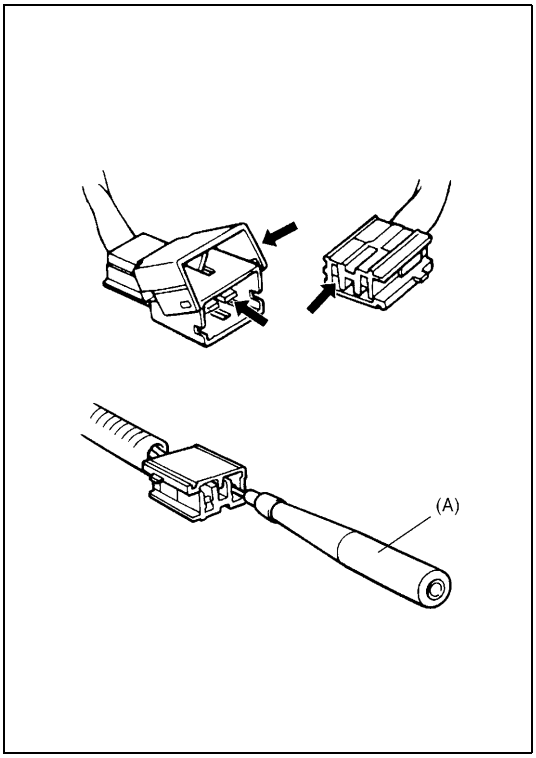
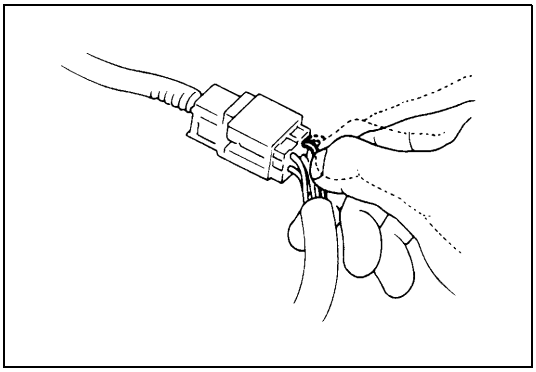
INTERMITTENTS AND POOR CONNECTIONS

Most intermittents are caused by faulty electrical connections or wiring. When a check for proper connection is requested in a diagnostic flow table, perform careful check of suspect circuits for:

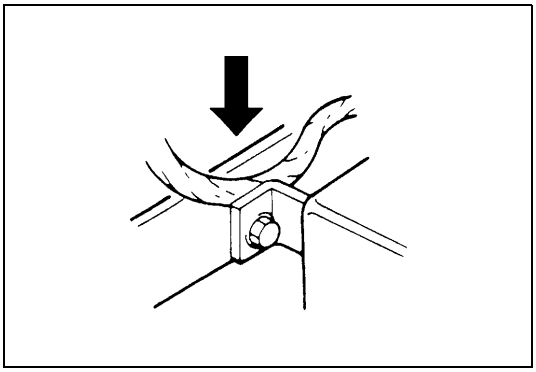


- Poor mating of connector halves, or terminals not fully seated in the connector body (backed out).
- Dirt or corrosion on the terminals. The terminals must be clean and free of any foreign material which could impede proper terminal contact.
  However, cleaning the terminal with a sand paper or the like is prohibited.
- Damaged connector body, exposing the terminals to moisture and dirt, as well as not maintaining proper terminal orientation with the component or mating connector.
- Improperly formed or damaged terminals.
  Check each connector terminal in problem circuits carefully to ensure good contact tension by using the corresponding mating terminal included in the connector test adapter kit (special tool).
  If contact tension is not enough, reform it to increase contact tension or replace.

Special tool
(A) : 09932-76010 (Connector Test Adapter Kit)



- Poor terminal-to-wire connection.
  Check each wire harness in problem circuits for poor connection by shaking it by hand lightly. If any abnormal condition is found, change the wire harness assembly or component parts with new ones.



- Wire insulation which is rubbed through, causing an intermittent short as the bare area touches other wiring or parts of the vehicle.
- Wire broken inside the insulation. This condition could cause a continuity check to show a good circuit, but if only 1 or 2 strands of a multi-strand-type wire are intact, resistance could be far too high.

If any abnormality is found, repair or replace as a wire harness assembly.

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AIR BAG DIAGNOSTIC SYSTEM CHECK

WARNING:

To avoid deployment when troubleshooting the air bag system, do not use electrical test equipment such as a battery powered or AC powered voltmeter, ohmmeter, etc., or any type of electrical equipment other than that specified in this manual. Do not use a non-powered probe type tester. Instructions in this manual must be followed carefully, otherwise personal injury may result.

CAUTION:

The order in which diagnostic trouble codes are diagnosed is very important. Failure to diagnose the diagnostic trouble codes in the order specified may result in extended diagnostic time, incorrect diagnosis and incorrect parts replacement.

The diagnostic procedures used in this section are designed to find and repair air bag system malfunctions. To get the best results, it is important to use the diagnostic flow tables and follow the sequence listed below.

1) Perform the AIR BAG DIAGNOSTIC SYSTEM CHECK FLOW TABLE.
   (The AIR BAG DIAGNOSTIC SYSTEM CHECK FLOW TABLE must be the starting point of any air bag system diagnosis.
   The AIR BAG DIAGNOSTIC SYSTEM CHECK FLOW TABLE checks for proper “AIR BAG” warning lamp operation through “AIR BAG” warning lamp and whether air bag diagnostic trouble codes exist.)
2) Refer to the proper diagnostic table as directed by the AIR BAG DIAGNOSTIC SYSTEM CHECK FLOW TABLE.
   (The AIR BAG DIAGNOSTIC SYSTEM CHECK FLOW TABLE will lead you to the correct table to diagnose any air bag system malfunctions. Bypassing these procedures may result in extended diagnostic time, incorrect diagnosis and incorrect parts replacement.)
3) Repeat the AIR BAG DIAGNOSTIC SYSTEM CHECK FLOW TABLE after any repair or diagnostic procedures have been performed.
   (Performing the AIR BAG DIAGNOSTIC SYSTEM CHECK FLOW TABLE after all repair or diagnostic procedures will ensure that the repair has been made correctly and that no other malfunctions exist.)

FLOW TABLE TEST DESCRIPTION

STEP 1 : Check that “AIR BAG” warning lamp lights.
STEP 2 : Check that “AIR BAG” warning lamp lights.
STEP 3 : Check diagnosis switch circuit.
STEP 4 : Check that “AIR BAG” warning lamp flashes 6 times after ignition switch is turned ON.
STEP 6 : Check that history codes are in SDM memory. (using SUZUKI scan tool)
STEP 7 : Check that history codes are in SDM memory. (using monitor coupler)
STEP 9 : Check that current code is in SDM memory. (using SUZUKI scan tool)
STEP 10 : Check that current code is in SDM memory. (using monitor coupler)

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AIR BAG DIAGNOSTIC SYSTEM CHECK FLOW TABLE

Step	Action	Yes	No
1	1) Make sure that battery voltage is about 11V or higher. 2) Note “AIR BAG” warning lamp as ignition switch is tuned ON. Does “AIR BAG” warning lamp come ON when ignition switch is tuned ON?	Go to step 2.	Proceed to Diagnostic Flow Table B (“AIR BAG” warning lamp circuit check).
2	Does “AIR BAG” warning lamp come ON steady?	Proceed to Diagnostic Flow Table A (“AIR BAG” warning lamp circuit check).	Go to step 3.
3	Does “AIR BAG” warning lamp keep flashing (indicating DTC) when ignition switch is ON?	Proceed to Diagnostic Flow Table C (“AIR BAG” warning lamp circuit check).	Go to step 4.
4	Does “AIR BAG” warning lamp turn OFF, after flashing 6 times?	Go to step 5.	Go to step 8.
5	Do you have SUZUKI scan tool?	Go to step 6.	Go to step 7.
6	1) Check DTC using SUZUKI scan tool. Refer to DTC CHECK. Is “NO CODES” displayed on SUZUKI scan tool?	Air bag system is in good condition.	An intermittent trouble has occurred at some place. Check the connector harness, etc. related to the sensed DTC. Refer to INTERMITTENT AND POOR CONNECTIONS in this section. Then clear DTC (Refer to DTC CLEARANCE.) and repeat this table.
7	1) Check DTC using monitor coupler. Refer to DTC CHECK. Is flashing pattern no. 12 indicated on “AIR BAG” warning lamp?	Air bag system is in good condition.	An intermittent trouble has occurred at some place. Check the connector harness, etc. related to the sensed DTC. Refer to INTERMITTENT AND POOR CONNECTIONS in this section. Then clear DTC (Refer to DTC CLEARANCE.) and repeat this table.
8	Do you have SUZUKI scan tool?	Go to step 9.	Go to step 10.
9	1) Check DTC using SUZUKI scan tool. Refer to DTC CHECK. Is “NO CODES” displayed on SUZUKI scan tool?	Substitute a known-good SDM and recheck.	Check and repair according to Flow Table corresponding to that DTC.
10	1) Check DTC using monitor coupler. Refer to DTC CHECK. Is flashing pattern no. 12 indicated on “AIR BAG” warning lamp?	Substitute a known-good SDM and recheck.	Check and repair according to Flow Table corresponding to that DTC.

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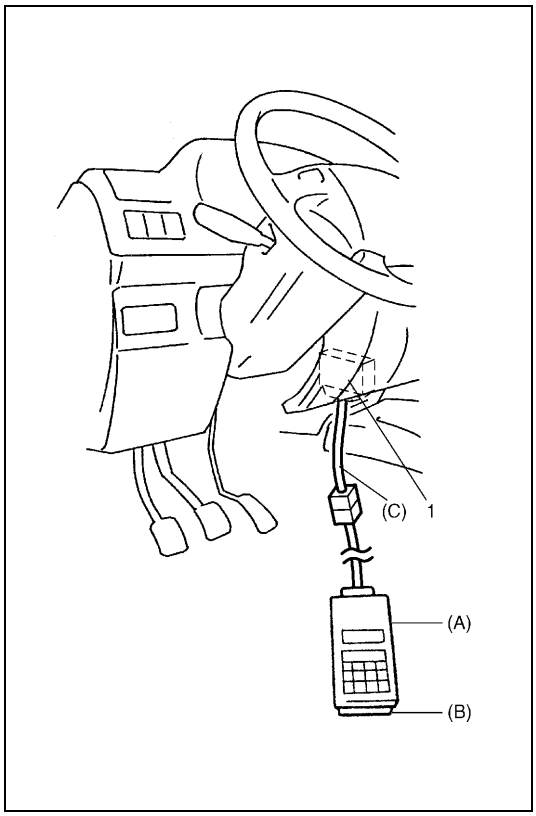
DTC CHECK

Using SUZUKI Scan Tool



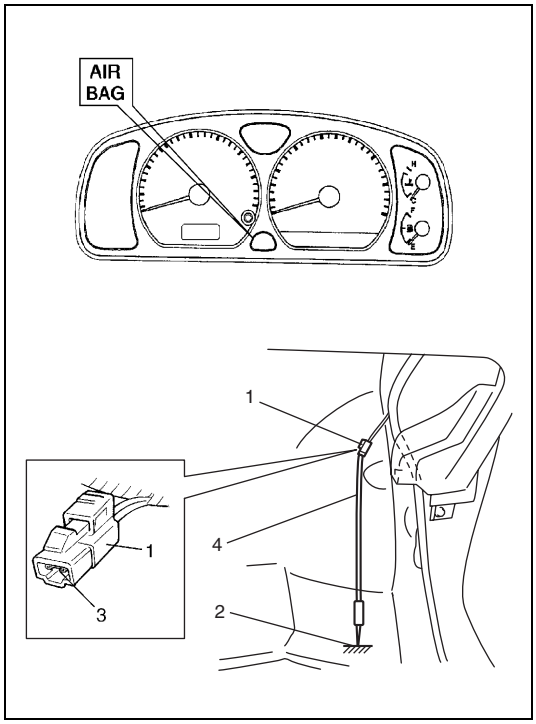
1) Turn ignition switch to OFF position.
2) After setting cartridge to SUZUKI scan tool, connect it to data link connector (DLC) located on underside of instrument panel at driver's seat side.

Special tool
(A) : 09931-76011 (SUZUKI scan tool)
(B) : Mass storage cartridge
(C) : 09931-76030 (16/14 pin DLC cable)

3) Turn ignition switch to ON position.
4) Read DTC according to instructions displayed on SUZUKI scan tool and print it or write it down. Refer to SUZUKI scan tool operator's manual for further details.
   If communication between scan tool and SDM is not possible, proceed to Diagnostic Flow Table E (Serial data check circuit).
5) After completing the check, turn ignition switch to OFF position and disconnect SUZUKI scan tool from data link connector (DLC).

1. Data link connector (DLC)

Not Using SUZUKI Scan Tool



1) Check that malfunction indicator lamp ("AIR BAG" warning lamp) comes ON when ignition switch is turned to ON position.
   If it does not come "ON", proceed to Diagnostic Flow Table B ("AIR BAG" warning lamp circuit).
2) Using service wire, ground diagnosis switch terminal in monitor coupler.
3) Read DTC from flashing pattern of malfunction indicator lamp ("AIR BAG" warning lamp). (Refer to DTC TABLE.)
   If lamp does not indicate DTC, proceed to Diagnostic Flow Table D (Diagnosis switch terminal circuit check).
4) After completing the check, turn ignition switch to OFF position and disconnect service wire from "AIR BAG" monitor coupler.

1. "AIR BAG" monitor coupler
2. Body ground
3. Diagnosis switch terminal
4. Service wire

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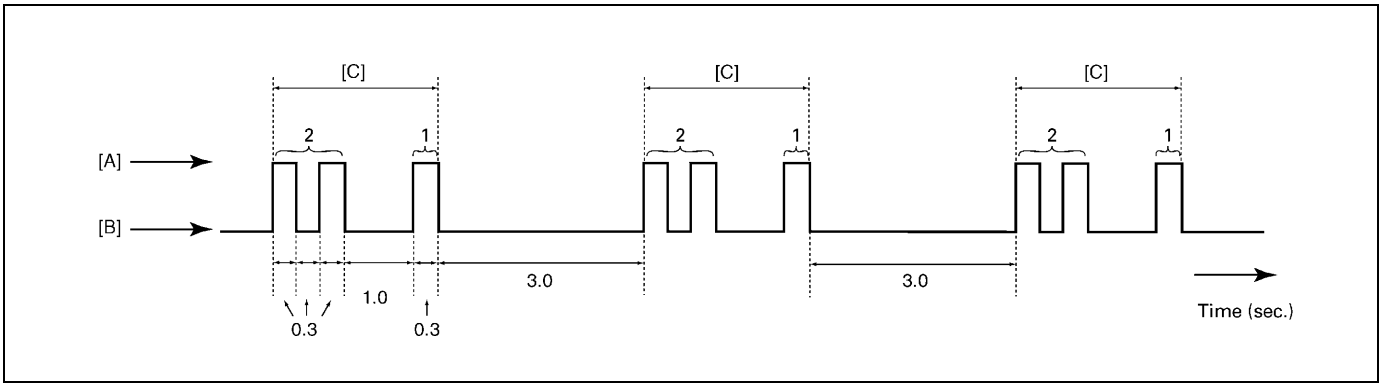
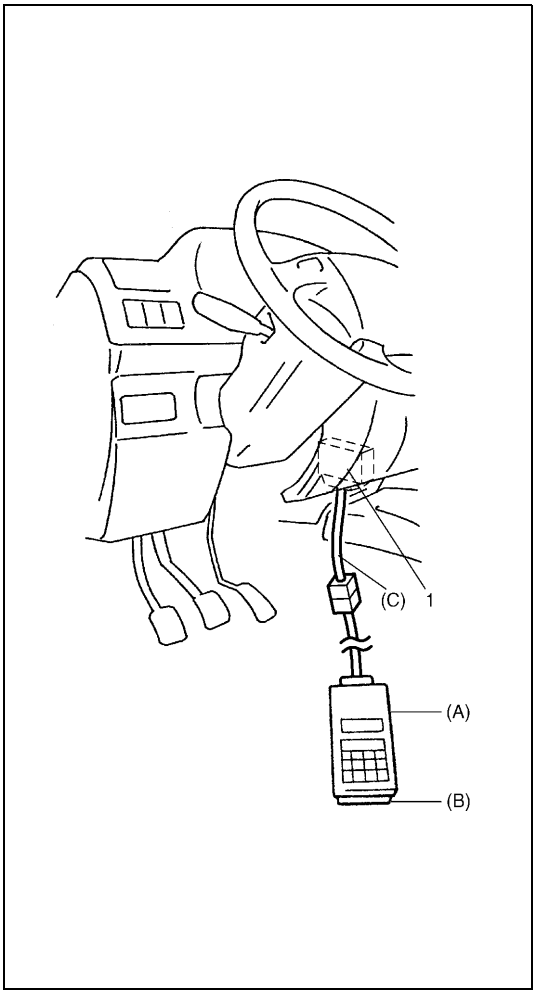
EXAMPLE : When driver air bag initiator circuit resistance high (DTC B1021) is set



[A]: "AIR BAG" warning lamp is turned ON
[B]: "AIR BAG" warning lamp is turned OFF
[C]: Code No.21

DTC CLEARANCE

Using SUZUKI Scan Tool



1) Turn ignition switch to OFF position.
2) Connect SUZUKI scan tool to data link connector (DLC) in the same manner as when making this connection for DTC check.

Special tool
(A) : 09931-76011 (SUZUKI scan tool)
(B) : Mass storage cartridge
(C) : 09931-76030 (16/14 pin DLC cable)

3) Turn ignition switch to ON position.
4) Erase DTC according to instructions displayed on SUZUKI scan tool.
   Refer to SUZUKI scan tool operator's manual for further details.
5) After completing the check, turn ignition switch to OFF position and disconnect SUZUKI scan tool from DLC.
6) Perform DTC CHECK and confirm that normal DTC (NO CODES) is displayed and not malfunction DTC.

NOTE:

If DTC B1051 or DTC B1071 is stored in SDM, it is not possible to clear DTC.

1. Data link connector (DLC)

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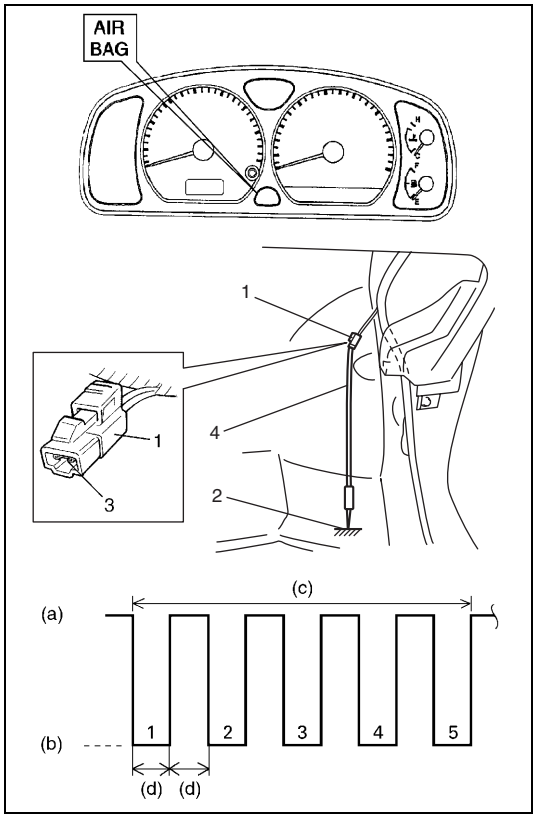

Not Using SUZUKI Scan Tool

1) Turn ignition switch to ON position and wait about 6 seconds or more.
2) Using service wire, repeat shorting and opening between diagnosis switch terminal on “AIR BAG” monitor coupler and body ground 5 times at about 1 second intervals.
3) Perform DTC CHECK and confirm that normal DTC (DTC 12) is displayed and not malfunction DTC.

NOTE:

If DTC B1051 or DTC B1071 is stored in SDM, it is not possible to clear DTC.

1. “AIR BAG” monitor coupler	(a) Open
2. Body ground	(b) Short
3. Diagnosis switch terminal	(c) About 10 seconds
4. Service wire	(d) 1 sec.

DTC TABLE

DTC	“AIR BAG” warning lamp flashing pattern		Diagnosis		
	NO.	MODE			
–	12		Normal		–
B1015	15		Passenger air bag circuit	Resistance high	Diagnose trouble according to diagnostic flow table corresponding to each code No.
B1016	16			Resistance low	
B1018	18			Short to ground	
B1019	19			Short to power circuit	
B1021	21		Driver air bag circuit	Resistance high	
B1022	22			Resistance low	
B1024	24			Short to ground	
B1025	25			Short to power circuit	
B1032	32		Power source voltage	Too low	

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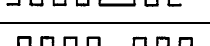
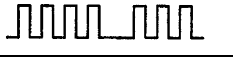
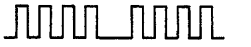
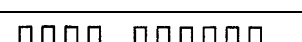
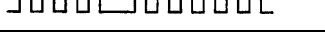
DTC	"AIR BAG" warning lamp flashing pattern		Diagnosis		
	NO.	MODE			
B1041	41		Driver pretensioner circuit	Resistance high	Diagnose trouble according to diagnostic flow table corresponding to each code No.
B1042	42			Resistance low	
B1043	43			Short to ground	
B1044	44			Short to power circuit	
B1045	45		Passenger pretensioner circuit	Resistance high	
B1046	46			Resistance low	
B1047	47			Short to ground	
B1048	48			Short to power circuit	
B1051	51		SDM	Frontal crash detected	
B1071	71			Internal fault	
B1013	13			Specifications different between air bag system and SDM	

NOTE:

- **When 2 or more codes are indicated, the lowest numbered code will appear first.**
- **Current DTC and history DTC can be identified by lighting and flashing of "AIR BAG" warning lamp as follows. However, if a multiple number of DTC's are set an even one of them is a current DTC, "AIR BAG" warning lamp remains on after ignition switch is turned ON. Therefore, it is not possible to identify any of them as to whether it is a current one or a history one. (But use of SUZUKI scan tool will make identification possible.)**

	Current DTC is set. (Abnormality exists at present.)	**History DTC is set only. (Faulty condition occurred once in the past but normal condition is restored at present.)**
"AIR BAG" warning lamp after ignition switch ON	**Flashing 6 times and turns on.**	**Flashing 6 times and turns off.**
"AIR BAG" warning lamp when grounding diagnosis switch	**Current DTC is displayed.**	**History DTC is displayed.**

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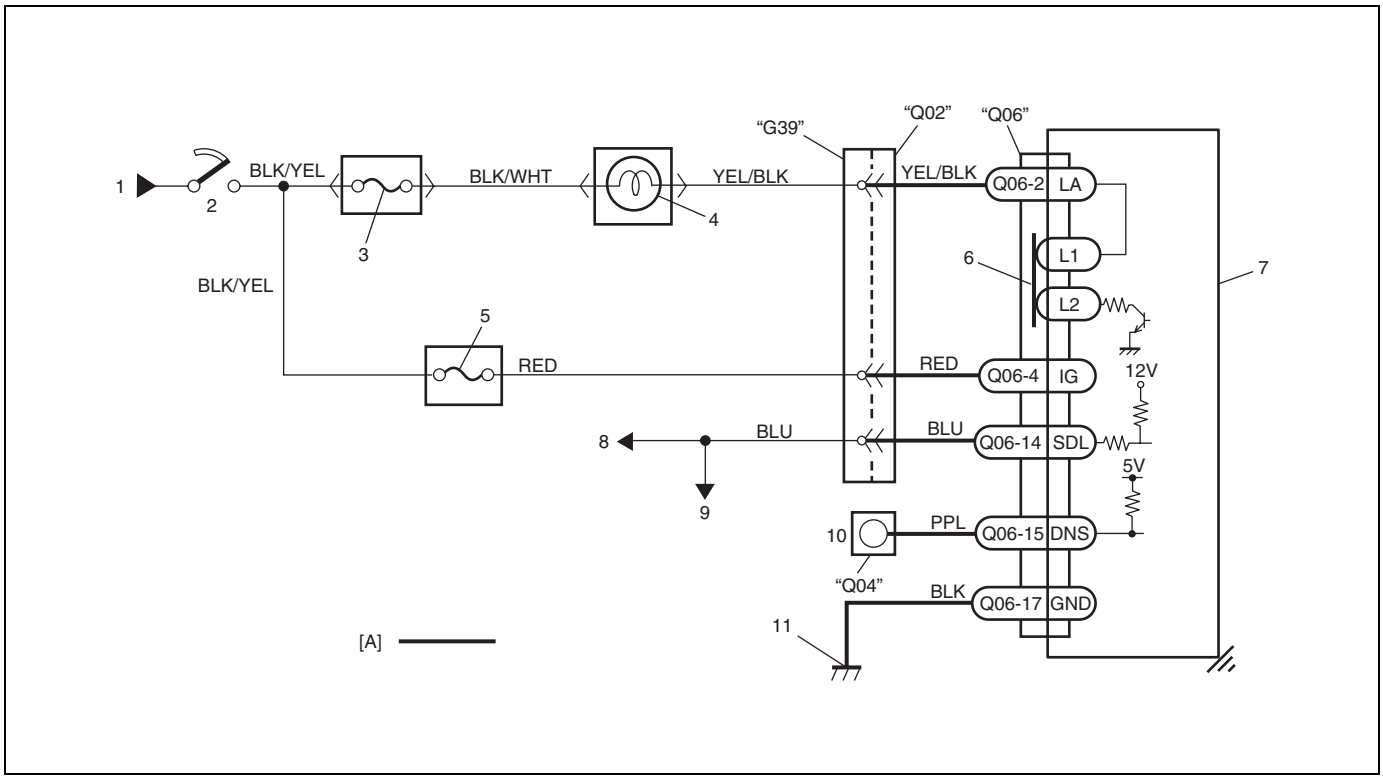
TABLE A - “AIR BAG” WARNING LAMP COMES ON STEADY

TABLE B - “AIR BAG” WARNING LAMP DOES NOT COME ON

TABLE C - “AIR BAG” WARNING LAMP FLASHES

TABLE D - “AIR BAG” WARNING LAMP CANNOT INDICATE FLASHING PATTERN OF DTC

WIRING DIAGRAM



1. From main fuse	5. “AIR BAG” fuse	9. To ECM, TCM (if equipped) and ABS control module (if equipped)
2. Ignition switch	6. Connection detection pin	10. “AIR BAG” monitor coupler
3. “IG·COIL METER” fuse	7. SDM	11. Ground for air bag system
4. “AIR BAG” warning lamp in combination meter	8. To DLC	[A]: Air bag harness

CAUTION:

- **Be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK before starting diagnosis according to flow table.**
- **When measurement of resistance or voltage is required in this table, use a tester along with a correct terminal adapter from special tool (Connector test adapter kit).**
- **When a check for proper connection is required, refer to INTERMITTENT AND POOR CONNECTIONS in this section.**
- **If there is open circuit in the air bag wire harness, connector or terminal is found damaged, replace the wire harness, connector and terminal as an assembly.**

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TABLE TEST DESCRIPTION

Table A :

STEP 1 : Check “AIR BAG” fuse.
STEP 2 : Check power source circuit.
STEP 3 : Check “AIR BAG” warning lamp circuit.

Table B :

STEP 1 : Check combination meter power feed circuit.
STEP 2 : Check electrical connection check mechanism in SDM connector.
STEP 3 : Check “AIR BAG” warning lamp circuit.
STEP 4 : Check open in “AIR BAG” warning lamp circuit.
STEP 5 : Check short from “AIR BAG” warning lamp circuit to power circuit.
STEP 6 : Check “AIR BAG” bulb.

Table C and D :

STEP 1 : Check “AIR BAG” monitor coupler.
STEP 2 : Check diagnosis switch circuit for air bag system.

DIAGNOSTIC FLOW TABLE

Table A :

Step	Action	Yes	No
1	1) Ignition switch OFF. 2) Remove and inspect “AIR BAG” fuse. Is fuse good?	Go to step 2.	“RED” wire short to ground. After repair, replace “AIR BAG” fuse.
2	1) Disconnect SDM. 2) Check proper connection to SDM at terminal “Q06-4”. 3) If OK then check voltage between “Q06-4” terminal of SDM connector and body ground with ignition switch ON. Is it 8 V or more?	Go to step 3.	“RED” wire (between “AIR BAG” fuse and SDM connector) open “BLK/YEL” wire (between ignition switch and “AIR BAG” fuse) open or short to ground
3	1) Disconnect 16-pin connector from combination meter. Refer to COMBINATION METER in SECTION 8. 2) Check resistance between “Q06-2” terminal of SDM connector and body ground. Is resistance 10 Ω or more?	Substitute a known-good SDM and recheck.	“YEL/BLK” wire (between combination meter and SDM connector) short to ground

Fig. for STEP 2

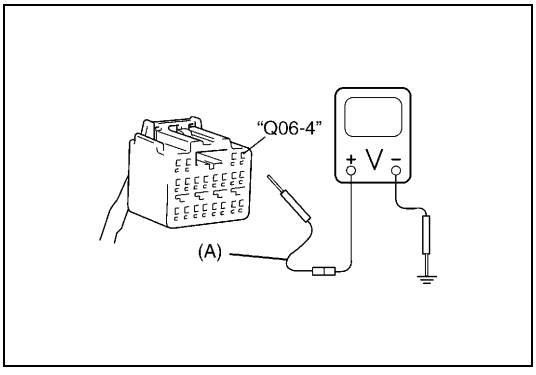

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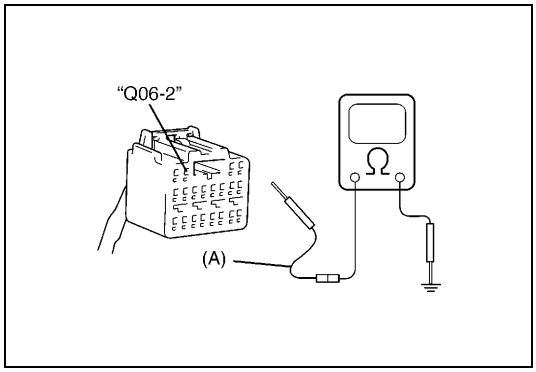
Fig. for STEP 3



Special tool
(A) : 09932-76010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

Table B :

Step	Action	Yes	No
1	1) Set parking brake. 2) Note combination meter when ignition switch is turned ON. Does the "BRAKE" indicator (warning lamp) come ON?	Go to step 2.	"BLK/WHT" wire, "IG METER" fuse or J/B (between ignition switch and combination meter) open or short to ground
2	1) With ignition switch OFF, disconnect SDM. 2) Check electrical connection check mechanism. Is it in good condition?	Go to step 3.	Repair electrical connection check mechanism.
3	1) Disconnect SDM. 2) Check proper connection to SDM at terminal "Q06-2". 3) If OK then check voltage from "Q06-2" terminal of SDM connector to body ground with ignition switch ON. Is it 8 V or more?	Substitute a known-good SDM and recheck.	Go to step 4.
4	1) Remove combination meter. Refer to COMBINATION METER in SECTION 8. 2) Check proper connection to combination meter at "YEL/BLK" terminal for "AIR BAG" warning lamp and to SDM at terminal "Q06-2". 3) If OK then check resistance between "YEL/BLK" wire terminal of combination meter connector (16-pin connector) and "Q06-2" terminal of SDM connector. Is resistance 1 Ω or less?	Go to step 5.	Repair high resistance or open in "YEL/BLK" wire circuit (between combination meter and SDM).

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Step	Action	Yes	No
5	1) Measure voltage from “Q06-2” terminal of SDM connector to body ground with ignition switch ON. Is it 8 V or more?	Repair short from “YEL/BLK” wire circuit (between combination meter and SDM) to power circuit.	Go to step 6.
6	1) Remove and inspect “AIR BAG” bulb. Is bulb good?	Substitute a known-good combination meter and recheck.	Replace bulb.

Fig. for STEP 2

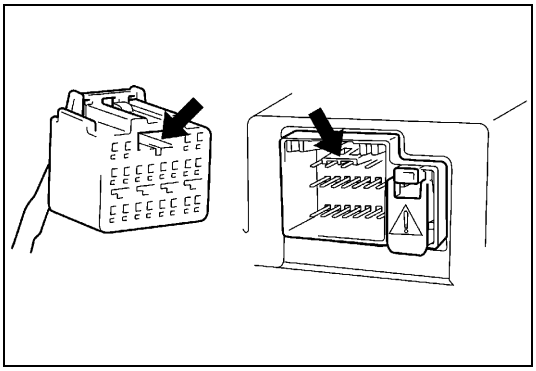
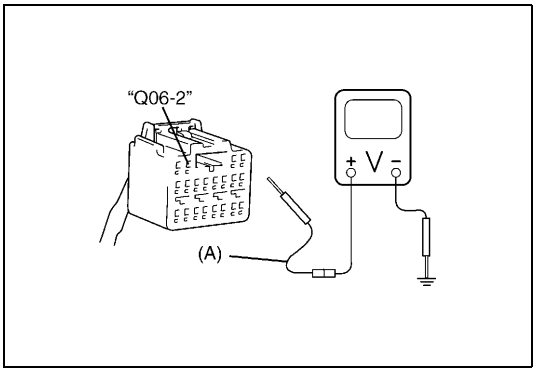
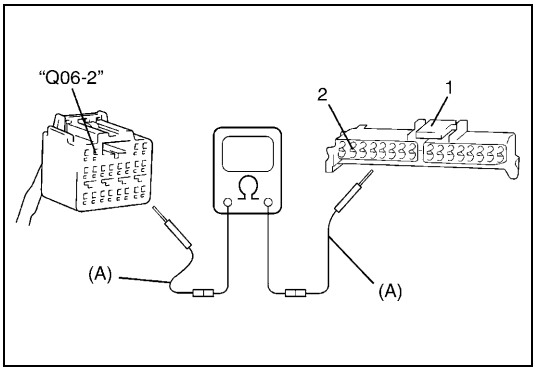


Fig. for STEP 3 and 5



Special tool
(A) : 09932-76010

Fig. for STEP 4



1.	16-pin connector (for combination meter)
2.	“YEL/BLK” wire terminal

Special tool
(A) : 09932-76010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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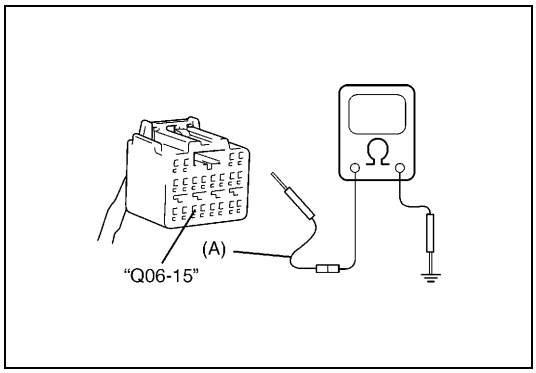
Table C :

Step	Action	Yes	No
1	1) Check “AIR BAG” monitor coupler. Is it connected diagnosis switch terminal and ground terminal in “AIR BAG” monitor coupler by service wire?	Remove service wire.	Go to step 2.
2	1) With ignition switch OFF, disconnect SDM. 2) Measure resistance between “Q06-15” terminal of SDM connector and body ground. Is resistance 1 Ω or more?	Substitute a known-good SDM and recheck.	Repair short from “PPL” wire circuit to ground.

Fig. for STEP 2



Special tool
(A) : 09932-76010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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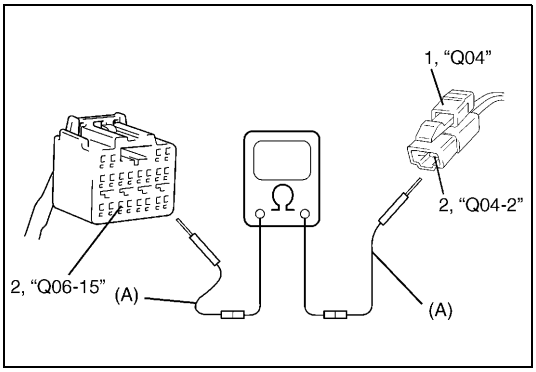
Table D :

Step	Action	Yes	No
1	1) Inspect connection between diagnostic switch terminal on “AIR BAG” monitor coupler and body ground by service wire. Is it securely connected between them by service wire?	Go to step 2.	Properly connection diagnostic switch terminal on “AIR BAG” monitor coupler and body ground by service wire.
2	1) Disconnect SDM connector from SDM. 2) Check for proper connection at “PPL” wire (“Q06-15” terminal of SDM connector and “Q04-2” terminal of “AIR BAG” monitor coupler) terminals. 3) If OK then measure resistance between “Q06-15” terminal and “Q04-2” terminal. Is resistance 1 Ω or more?	Check “PPL” wire terminals. If OK then “PPL” wire circuit high resistance or open.	Substitute a known good SDM and recheck

Fig. for STEP 2



1.	“AIR BAG” monitor coupler
2.	“PPL” wire terminal

Special tool
(A) : 09932-76010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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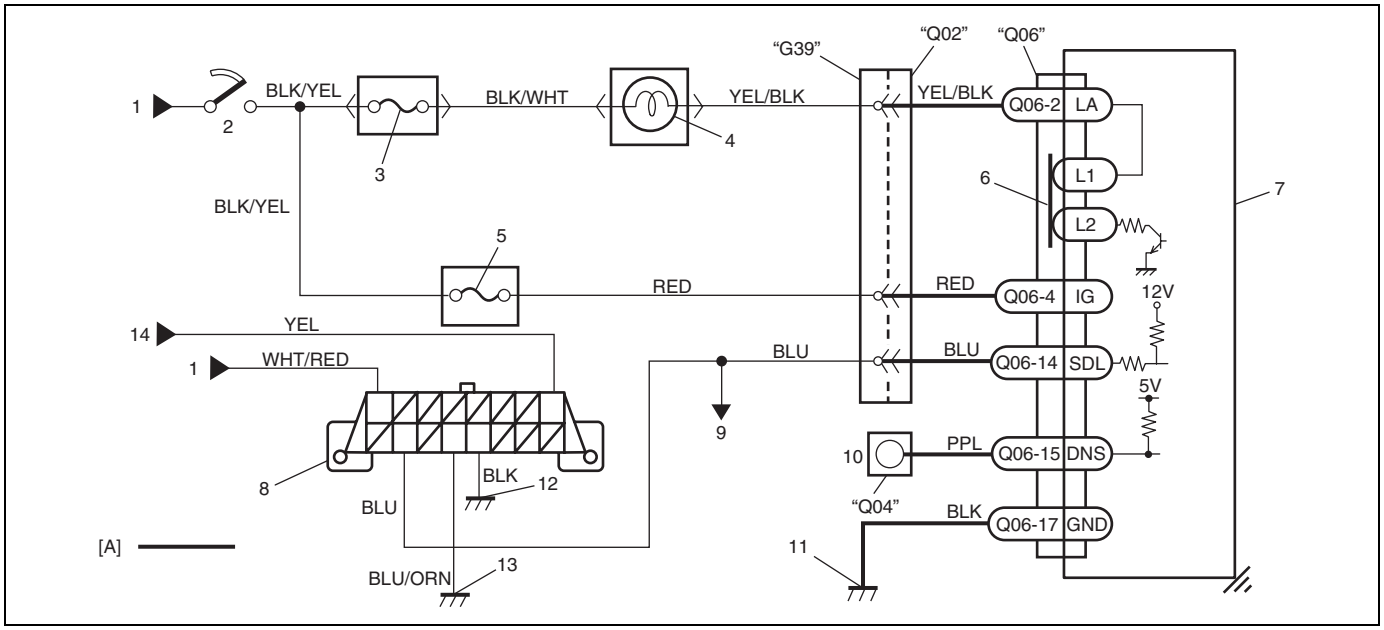
TABLE E - SDM CANNOT COMMUNICATE THROUGH THE SERIAL DATA CIRCUIT

WIRING DIAGRAM



[A]: Air bag harness	5. "AIR BAG" fuse	10. "AIR BAG" monitor coupler
1. From main fuse	6. Connection detection pin	11. Ground for air bag system
2. Ignition switch	7. SDM	12. Ground on body
3. "IG METER" fuse	8. DLC	13. Ground on Engine block
4. "AIR BAG" warning lamp in combination lamp	9. To ECM, TCM (if equipped) and ABS control module (if equipped)	14. Immobilizer control module (if equipped)

CAUTION:

- **Be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK before starting diagnosis according to flow table.**
- **When measurement of resistance or voltage is required in this table, use a tester along with a correct terminal adapter from special tool (Connector test adapter kit).**
- **When a check for proper connection is required, refer to INTERMITTENT AND POOR CONNECTIONS in this section.**
- **If there is open circuit in the air bag wire harness, connector or terminal is found damaged, replace the wire harness, connector and terminal as an assembly.**

TABLE TEST DESCRIPTION

STEP 1 : An improper connection to the data link connector (DLC) will prevent communications from being established.
STEP 2 : This test checks whether it is possible to communicate with other control module.
STEP 3 : This test checks for an open in "BLU" circuit (in air bag harness).

DIAGNOSTIC FLOW TABLE

Step	Action	Yes	No
1	1) Make sure that SUZUKI scan tool is free from malfunction and correct cartridge for air bag system is used. 2) Ignition switch OFF. 3) Check proper connection of SUZUKI scan tool to DLC. Is connection in good condition?	Go to step 2.	Properly connect SUZUKI scan tool to DLC.

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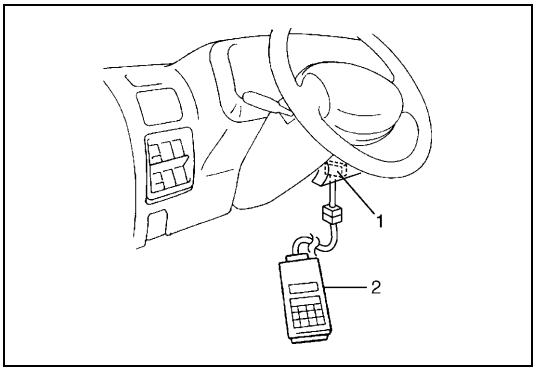
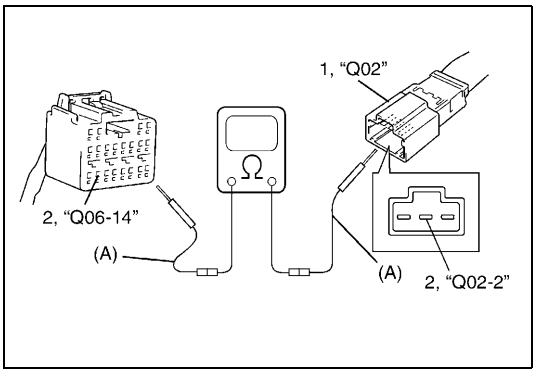
Step	Action	Yes	No
2	1) Check if communication is possible by trying communication with other control module (ECM, TCM (if equipped) or ABS control module (if equipped)). Is it possible to communicate with other control module?	Go to step 3.	Repair open in common section of serial data circuit (“BLU” wire circuit) used by all controllers or short to ground or power circuit which has occurred somewhere in serial data circuit (“BLU” wire circuit).
3	1) With ignition switch OFF, disconnect SDM and “Q02” connector. 2) Check proper connection at “Q02-2” (“BLU” wire) terminal for DLC. 3) If OK, then check resistance between “Q02-2” (“BLU” wire) terminal and “Q06-14” terminal of SDM connector. Is resistance 1 Ω or less?	Substitute a known-good SDM and recheck.	Repair high resistance or open in “BLU” wire circuit (in air bag harness).

Fig. for STEP 1



1.	DLC
2.	Scan tool

Fig. for STEP 3



1.	Air bag harness side connector
2.	“BLU” wire terminal

Special tool
(A) : 09932-76010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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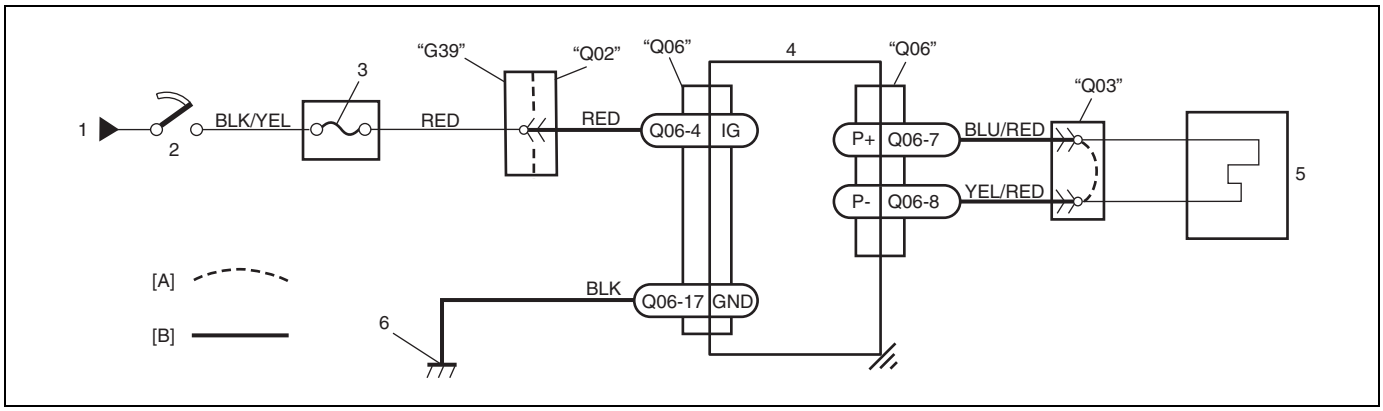
DTC B1015 - PASSENGER AIR BAG INITIATOR CIRCUIT RESISTANCE HIGH
DTC B1016 - PASSENGER AIR BAG INITIATOR CIRCUIT RESISTANCE LOW
DTC B1018 - PASSENGER AIR BAG INITIATOR CIRCUIT SHORT TO GROUND
DTC B1019 - PASSENGER AIR BAG INITIATOR CIRCUIT SHORT TO POWER CIRCUIT

WIRING DIAGRAM



[A]: Shorting bar	1. From main fuse	3. "AIR BAG" fuse	5. Passenger air bag (inflator) module
[B]: Air bag harness	2. Ignition switch	4. SDM	6. Ground for air bag system

CAUTION:

- **Be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK before starting diagnosis according to flow table.**
- **When measurement of resistance or voltage is required in this table, use a tester along with a correct terminal adaptor from special tool (Connector test adapter kit).**
- **When a check for proper connection is required, refer to INTERMITTENT AND POOR CONNECTIONS in this section.**
- **If there is open circuit in the air bag wire harness, connector or terminal is found damaged, replace the wire harness, connector and terminal as an assembly.**

DTC WILL SET WHEN

DTC B1015 :

The combined resistance of the passenger air bag (inflator) module, harness wiring and connector terminal contact is above a specified value for specified time.

DTC B1016 :

The combined resistance of the passenger air bag (inflator) module, harness wiring and connector terminal contact is below a specified value for specified time.

DTC B1018 :

The voltage measured at passenger air bag initiator circuit is below a specified value for specified time.

DTC B1019 :

The voltage measured at passenger air bag initiator circuit is above a specified value for specified time.

TABLE TEST DESCRIPTION

DTC B1015, B1016, B1018 and B1019 :

STEP 1 : Check whether malfunction is in passenger air bag (inflator) module.
STEP 2 : Check passenger air bag (inflator) module initiator circuit in air bag harness.
STEP 3 : Check passenger air bag (inflator) module initiator circuit in air bag harness. (for DTC B1019 only)

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DIAGNOSTIC FLOW TABLE

DTC B1015 :

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect passenger air bag (inflator) module connector behind the glove box. 2) Check proper connection to passenger air bag (inflator) module at terminals in "Q03" connector. 3) If OK then connect Special Tool (B) to passenger air bag (inflator) module connector disconnected at the step 1). With ignition switch ON, is DTC B1015 current?	Go to step 2.	Ignition switch OFF. Replace passenger air bag (inflator) module (Refer to PASSENGER AIR BAG (INFLATOR) MODULE in this section).
2	1) With ignition switch OFF, disconnect SDM. 2) Check proper connection to SDM at terminals "Q06-7" and "Q06-8". 3) If OK then measure resistance between "Q06-7" and "Q06-8" terminals with connected Special Tool (B). Is resistance 4.5 Ω or less?	Substitute a known-good SDM and recheck.	Repair high resistance or open in "YEL/RED" or "BLU/RED" wire circuit.

Fig. for STEP 1 and 2

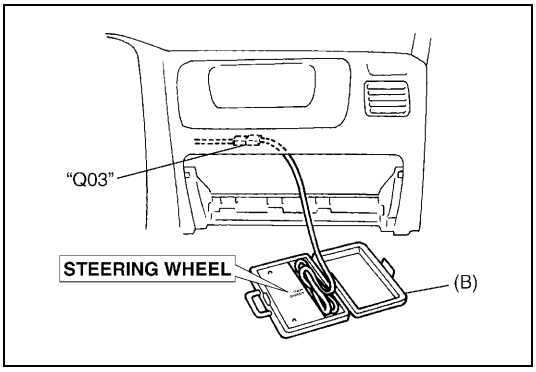
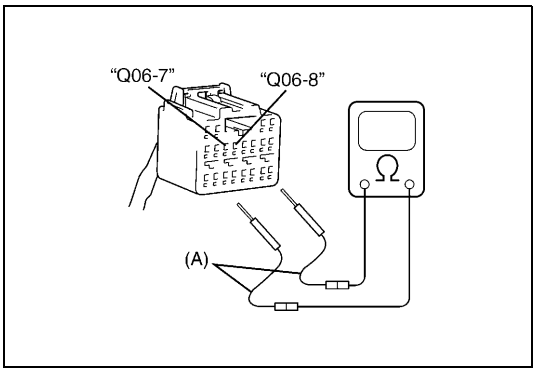


Fig. for STEP 2



Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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DTC B1016:

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect passenger air bag (inflator) module connector behind the glove box. 2) Check proper connection to passenger air bag (inflator) module at terminals in "Q03" connector. 3) If OK then connect Special Tool (B) to passenger air bag (inflator) module connector disconnected at the step 1). With ignition switch ON, is DTC B1016 current?	Go to step 2.	Ignition switch OFF. Replace passenger air bag (inflator) module (Refer to PASSENGER AIR BAG (INFLATOR) MODULE in this section).
2	1) With ignition switch OFF, disconnect SDM. 2) Check proper connection to SDM at terminals "Q06-7" and "Q06-8". 3) If OK then measure resistance between "Q06-7" and "Q06-8" terminals with connected Special Tool (B). Is resistance 1.4 Ω or more?	Substitute a known-good SDM and recheck.	Repair short from "YEL/RED" wire circuit to "BLU/RED" wire circuit or from "YEL/RED" or "BLU/RED" wire circuit to other wire circuit.

Fig. for STEP 1 and 2

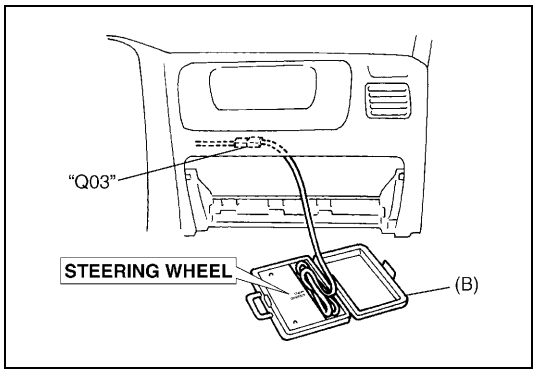
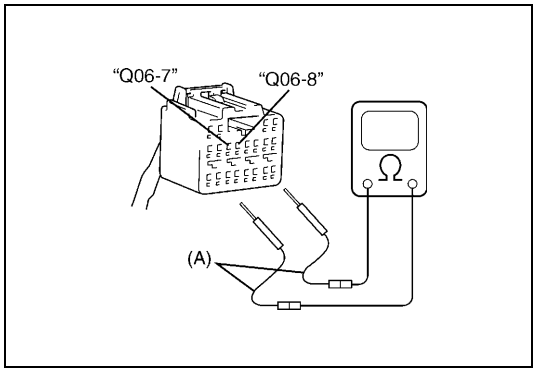


Fig. for STEP 2



Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

1) Reconnect all air bag system components, ensure all components are properly mounted.
2) Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.
3) Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.

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DTC B1018:

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect passenger air bag (inflator) module connector behind the glove box. 2) Check proper connection to passenger air bag (inflator) module at terminals in “Q03” connector. 3) If OK then connect Special Tool (B) to passenger air bag (inflator) module connector disconnected at the step 1). With ignition switch ON, is DTC B1018 current?	Go to step 2.	Ignition switch OFF. Replace passenger air bag (inflator) module (Refer to PASSENGER AIR BAG (INFLATOR) MODULE in this section).
2	1) With ignition switch OFF, disconnect Special Tool (B) and SDM. 2) Measure resistance between “Q06-7” terminals and body ground. Is resistance 10 W or more?	Go to step 3.	Repair short from “BLU/RED” wire circuit to ground.
3	1) Measure resistance between “Q06-8” terminal and body ground. Is resistance 10 Ω or more?	Substitute a known-good SDM and recheck.	Repair short from “YEL/RED” wire circuit to ground.

Fig. for STEP 1, 2 and 3

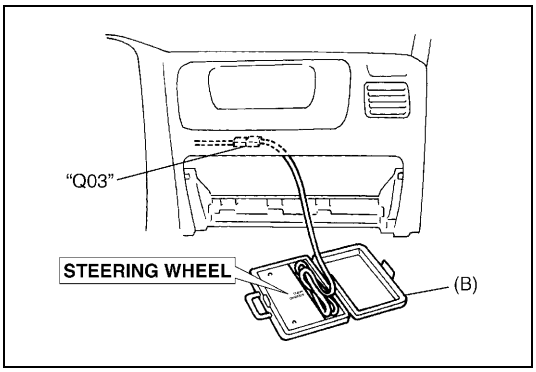

Fig. for STEP 2

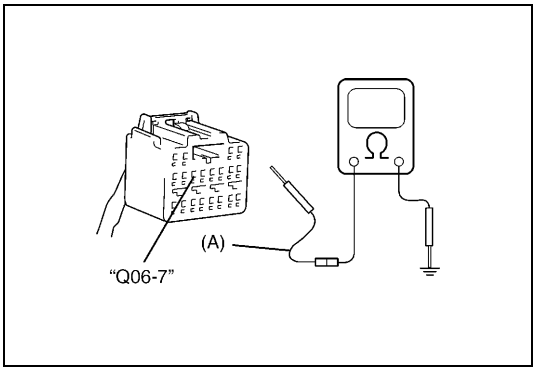

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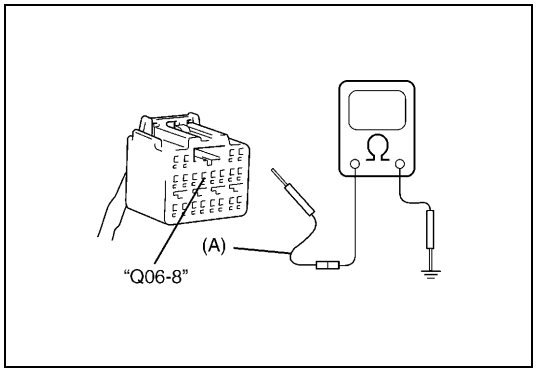
Fig. for STEP 3



Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

DTC B1019:

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect passenger air bag (inflator) module connector behind the glove box. 2) Check proper connection to passenger air bag (inflator) module at terminals in "Q03" connector. 3) If OK then connect Special Tool (B) to passenger air bag (inflator) module connector disconnected at the step 1). With ignition switch ON, is DTC B1019 current?	Go to step 2.	Ignition switch OFF. Replace passenger air bag (inflator) module (Refer to PASSENGER AIR BAG (INFLATOR) MODULE in this section).
2	1) With ignition switch OFF, disconnect Special Tool (B) and SDM. 2) Measure voltage from "Q06-7" terminal to body ground. With ignition switch ON, is voltage 1 V or less?	Go to step 3.	Repair short from "BLU/RED" wire circuit to power circuit.
3	1) Measure voltage from "Q06-8" terminal to body ground. With ignition switch ON, is voltage 1 V or less?	Substitute a known-good SDM and recheck.	Repair short from "YEL/RED" wire circuit to power circuit.

Fig. for STEP 1, 2 and 3

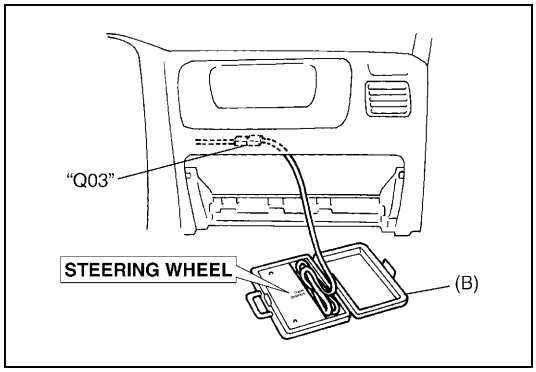


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Fig. for STEP 2

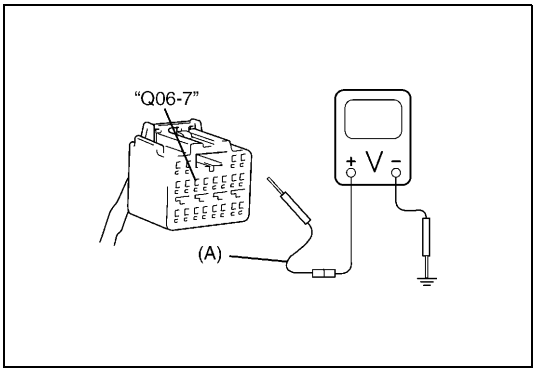
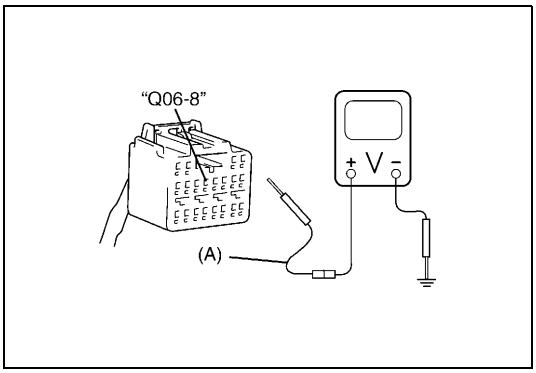


Fig. for STEP 3



Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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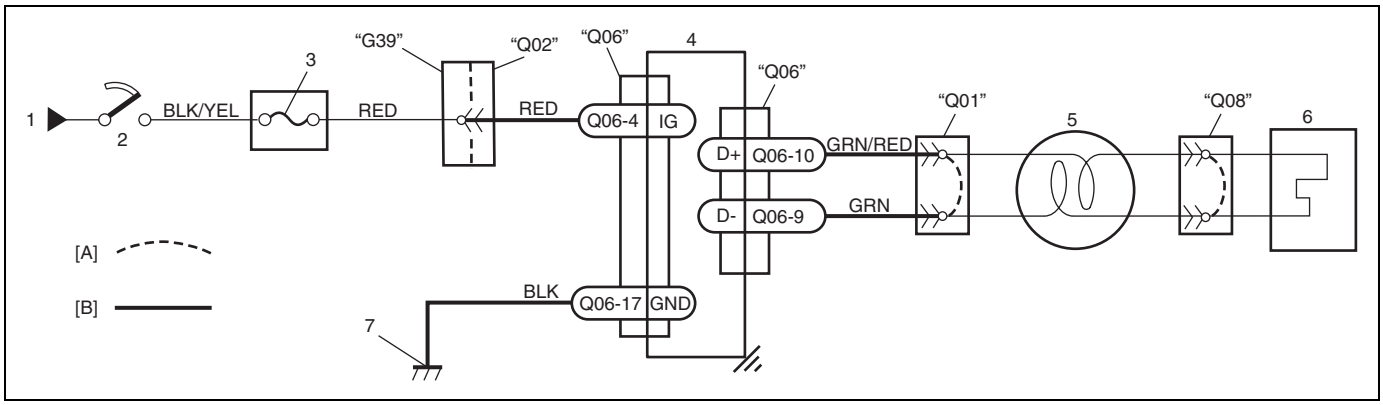
DTC B1021 – DRIVER AIR BAG INITIATOR CIRCUIT RESISTANCE HIGH
DTC B1022 – DRIVER AIR BAG INITIATOR CIRCUIT RESISTANCE LOW
DTC B1024 – DRIVER AIR BAG INITIATOR CIRCUIT SHORT TO GROUND
DTC B1025 – DRIVER AIR BAG INITIATOR CIRCUIT SHORT TO POWER CIRCUIT

WIRING DIAGRAM



[A] : Shorting bar	2. Ignition switch	5. Contact coil assembly
[B] : Airbag harness	3. "AIR BAG" fuse	6. Driver air bag (inflator) module
1. From main fuse	4. SDM	7. Ground for air bag system

CAUTION:

- Be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK before starting diagnosis according to flow table.
- When measurement of resistance or voltage is required in this table, use a tester along with a correct terminal adapter from special tool (Connector test adapter kit).
- When a check for proper connection is required, refer to INTERMITTENT AND POOR CONNECTIONS in this section.
- If there is open circuit in the air bag wire harness, connector or terminal is found damaged, replace the wire harness, connector and terminal as an assembly.

DTC WILL SET WHEN

DTC B1021 :

The combined resistance of the driver air bag (inflator) module, contact coil assembly, harness wiring and connector terminal contact is above a specified value for specified time.

DTC B1022 :

The combined resistance of the driver air bag (inflator) module, contact coil assembly, harness wiring and connector terminal contact is below a specified value for specified time.

DTC B1024 :

The voltage measured at driver air bag initiator circuit is below a specified value for specified time.

DTC B1025 :

The voltage measured at driver air bag initiator circuit is above a specified value for specified time.

TABLE TEST DESCRIPTION

DTC B1021, B1022, B1024 and B1025 :

STEP 1 : Check whether malfunction is in contact coil and driver air bag (inflator) module or the others.
STEP 2 : Check driver air bag (inflator) module initiator circuit in air bag harness.
STEP 3 : Check whether malfunction is in contact coil or driver air bag (inflator) module.

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DIAGNOSTIC FLOW TABLE

DTC B1021 :

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect contact coil connector located near the base of the steering column. 2) Check proper connection to contact coil at terminals in “Q01” connector. 3) If OK then connect Special Tool (B) to contact coil connector disconnected at step 1). With ignition switch ON, is DTC B1021 current?	Go to step 2.	Go to step 3.
2	1) With ignition switch OFF, disconnect SDM. 2) Check proper connection to SDM at terminals “Q06-9” and “Q06-10”. 3) If OK then measure resistance between “Q06-9” and “Q06-10” terminals with connected Special Tool (B). Is resistance 4.5 Ω or less?	Substitute a known-good SDM and recheck.	Repair high resistance or open in “GRN” or “GRN/RED” wire circuit.
3	1) With ignition switch OFF, disconnect Special Tool (B) then reconnect contact coil connector located near the base of the steering column. 2) Remove driver air bag (inflator) module from steering wheel (Refer to DRIVER AIR BAG (INFLATOR) MODULE in Section 3C). 3) Check proper connection to driver air bag (inflator) module at terminals in “Q08” connector. 4) If OK then connect Special Tool (B) to “Q08” connector. With ignition switch ON, is DTC B1021 current?	Ignition switch OFF. Replace contact coil assembly (Refer to COMBINATION SWITCH/CONTACT COIL AND COMBINATION SWITCH ASSEMBLY in Section 3C).	Ignition switch OFF. Replace driver air bag (inflator) module (Refer to DRIVER AIR BAG (INFLATOR) MODULE in Section 3C).

Fig. for STEP 1 and 2

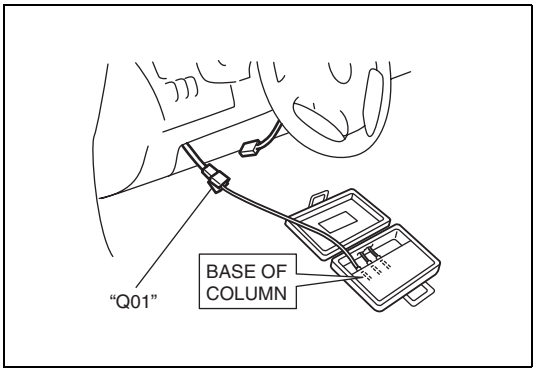

Fig. for STEP 2

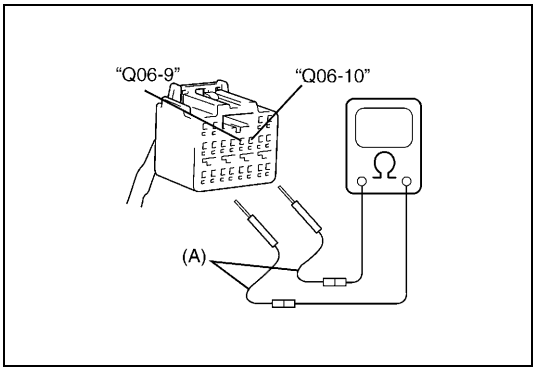

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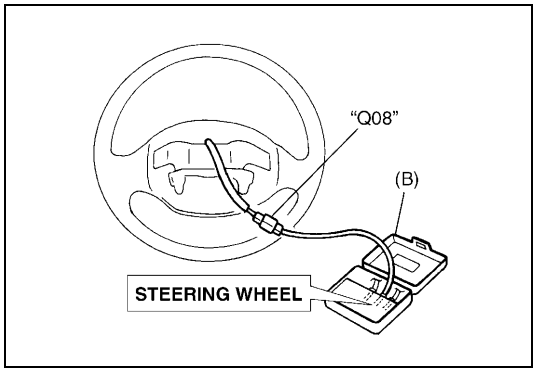
Fig. for STEP 3



Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

DTC B1022 :

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect contact coil connector located near the base of the steering column. 2) Check proper connection to contact coil at terminals in "Q01" connector. 3) If OK then connect Special Tool (B) to contact coil connector disconnected at step 1). With ignition switch ON, is DTC B1022 current?	Go to step 2.	Go to step 3.
2	1) With ignition switch OFF, disconnect SDM. 2) Check proper connection to SDM at terminals "Q06-9" and "Q06-10". 3) If OK then measure resistance between "Q06-9" and "Q06-10" terminals with connected Special Tool (B). Is resistance 1.7 Ω or more?	Substitute a known-good SDM and recheck.	Repair short from "GRN" wire circuit to "GRN/RED" wire circuit or from "GRN" or "GRN/RED" wire circuit to other wire circuit.
3	1) With ignition switch OFF, disconnect Special Tool (B) then reconnect contact coil connector located near the base of the steering column. 2) Remove driver air bag (inflator) module from steering wheel (Refer to DRIVER AIR BAG (INFLATOR) MODULE in Section 3C). 3) Check proper connection to driver air bag (inflator) module at terminals in "Q08" connector. 4) If OK then connect Special Tool (B) to "Q08" connector. With ignition switch ON, is DTC B1022 current?	Ignition switch OFF. Replace contact coil assembly (Refer to COMBINATION SWITCH/ CONTACT COIL AND COMBINATION SWITCH ASSEMBLY in Section 3C).	Ignition switch OFF. Replace driver air bag (inflator) module (Refer to DRIVER AIR BAG (INFLATOR) MODULE in Section 3C).

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Fig. for STEP 1 and 2

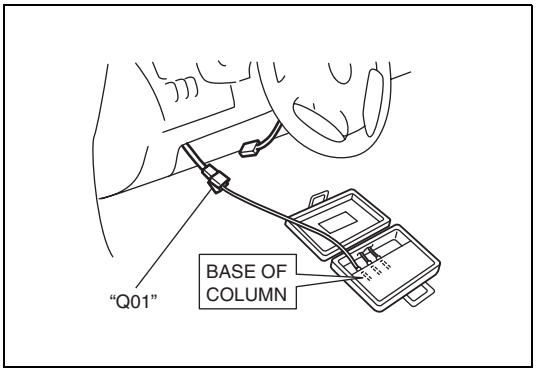


Fig. for STEP 2

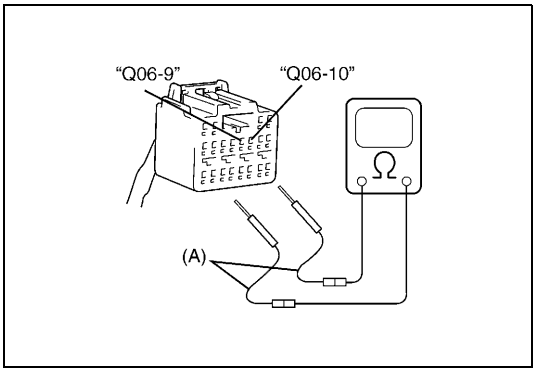
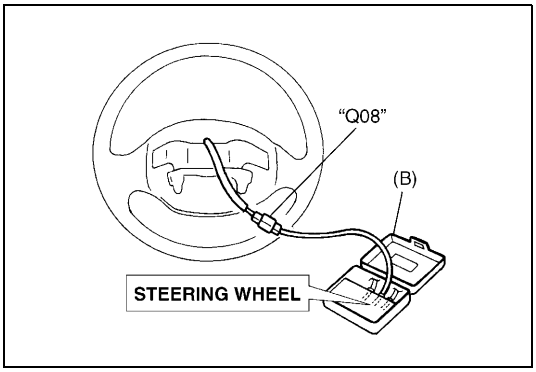


Fig. for STEP 3



Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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DTC B1024 :

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect contact coil connector located near the base of the steering column. 2) Check proper connection to contact coil at terminals in “Q01” connector. 3) If OK then connect Special Tool (B) to contact coil connector disconnected at step 1). With ignition switch ON, is DTC B1024 current?	Go to step 2.	Go to step 3.
2	1) With ignition switch OFF, disconnect Special Tool (B) and SDM. 2) Measure resistance between “Q06-9” terminal and body ground and between “Q06-10” terminal and body ground. Are they 10 Ω or more?	Substitute a known-good SDM and recheck.	Repair short from “GRN” or “GRN/RED” wire circuit to ground.
3	1) With ignition switch OFF, disconnect Special Tool (B) then reconnect contact coil connector located near the base of the steering column. 2) Remove driver air bag (inflator) module from steering wheel (Refer to DRIVER AIR BAG (INFLATOR) MODULE in Section 3C). 3) Check proper connection to driver air bag (inflator) module at terminals in “Q08” connector. 4) If OK then connect Special Tool (B) to “Q08” connector. With ignition switch ON, is DTC B1024 current?	Ignition switch OFF. Replace contact coil assembly (Refer to COMBINATION SWITCH/CONTACT COIL AND COMBINATION SWITCH ASSEMBLY in Section 3C).	Ignition switch OFF. Replace driver air bag (inflator) module (Refer to DRIVER AIR BAG (INFLATOR) MODULE in Section 3C).

Fig. for STEP 1 and 2

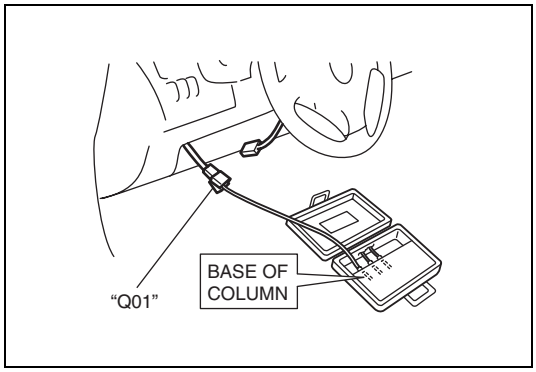

Fig. for STEP 2

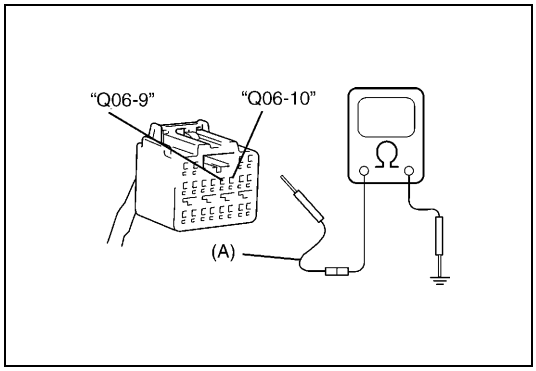

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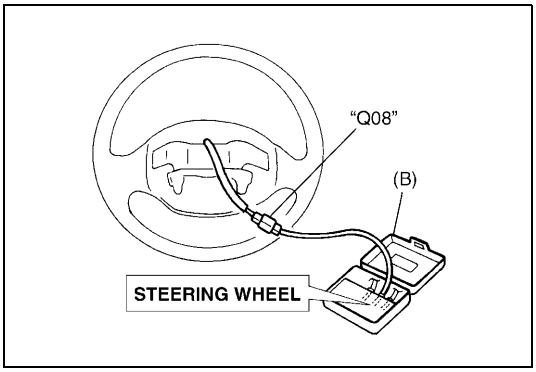
Fig. for STEP 3



Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

DTC B1025 :

Step	Action	Yes	No
1	1) With ignition switch OFF, disconnect contact coil connector located near the base of the steering column. 2) Check proper connection to contact coil at terminals in "Q01" connector. 3) If OK then connect Special Tool (B) to contact coil connector disconnected at step 1). With ignition switch ON, is DTC B1025 current?	Go to step 2.	Go to step 3.
2	1) With ignition switch OFF, disconnect Special Tool (B) and SDM. 2) Measure voltage from " Q06-9" terminal to body ground and from "Q06-10" terminal to body ground. With ignition switch ON, are they 1 V or less?	Substitute a known-good SDM and recheck.	Repair short from "GRN" or "GRN/RED" wire circuit to power circuit.
3	1) With ignition switch OFF, disconnect Special Tool (B) then reconnect contact coil connector located near the base of the steering column. 2) Remove driver air bag (inflator) module from steering wheel (Refer to DRIVER AIR BAG (INFLATOR) MODULE in Section 3C). 3) Check proper connection to driver air bag (inflator) module at terminals in "Q08" connector. 4) If OK then connect Special Tool (B) to "Q08" connector. With ignition switch ON, is DTC B1025 current?	Ignition switch OFF. Replace contact coil assembly (Refer to COMBINATION SWITCH/ CONTACT COIL AND COMBINATION SWITCH ASSEMBLY in Section 3C).	Ignition switch OFF. Replace driver air bag (inflator) module (Refer to DRIVER AIR BAG (INFLATOR) MODULE in Section 3C).

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Fig. for STEP 1 and 2

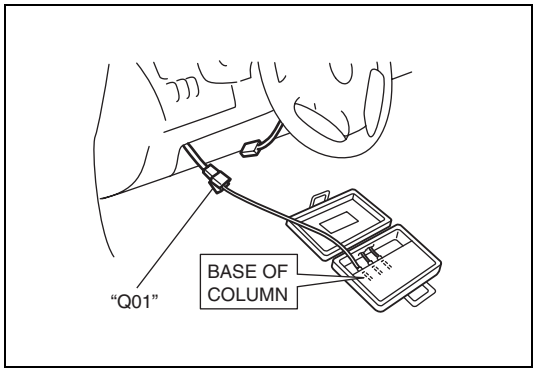


Fig. for STEP 2

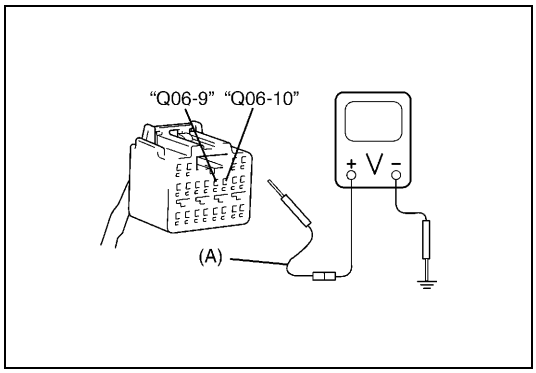
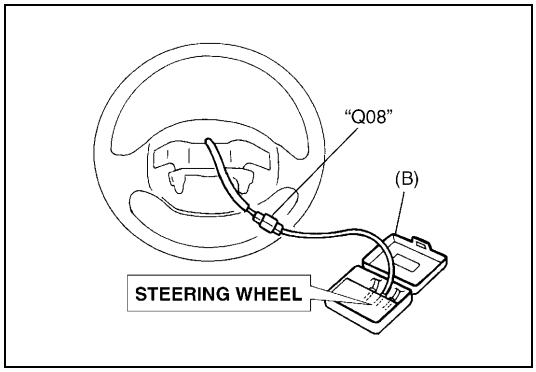


Fig. for STEP 3



Tightening torque
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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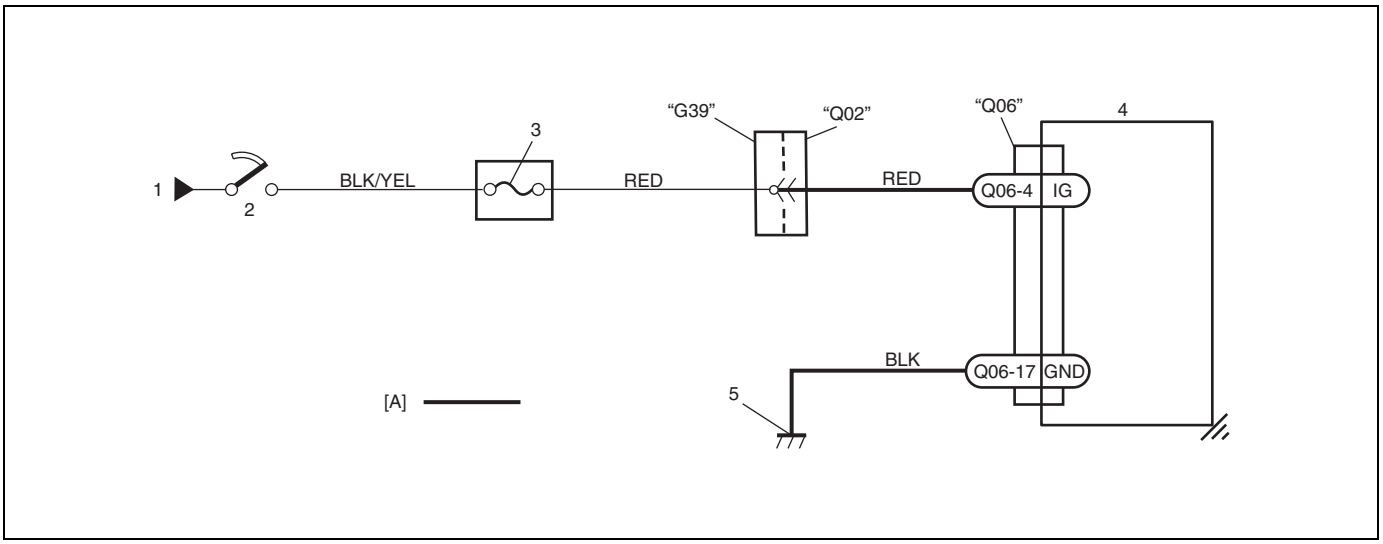
DTC B1032 – POWER SOURCE VOLTAGE LOW

WIRING DIAGRAM



[A] : Air bag harness	2. Ignition switch	4. SDM
1. From main fuse	3. "AIR BAG" fuse	5. Ground for air bag system

CAUTION:

- **Be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK before starting diagnosis according to flow table.**
- **When measurement of resistance or voltage is required in this table, use a tester along with a correct terminal adapter from special tool (Connector test adapter kit).**
- **When a check for proper connection is required, refer to INTERMITTENT AND POOR CONNECTIONS in this section.**
- **If there is open circuit in the air bag wire harness, connector or terminal is found damaged, replace the wire harness, connector and terminal as an assembly.**

DTC WILL SET WHEN

The power source voltage is below an approx. 8 V for specified time.

TABLE TEST DESCRIPTION

STEP 1 : Check if voltage applied to SDM is within normal range.
STEP 2 : Check if DTC 32 still exists.

DIAGNOSTIC FLOW TABLE

Step	Action	Yes	No
1	1) Measure voltage on battery. Is voltage 11 V or more?	Go to step 2.	Check Charging System and repair as necessary. (Refer to DIAGNOSIS in Section 6H)
2	1) With ignition switch OFF, disconnect SDM. 2) Check proper connection to SDM at "Q06-4" terminal. 3) If OK then ignition switch ON, and then check voltage from "Q06-4" terminal on SDM connector to body ground. Is voltage 8 V or more?	Go to step 4.	Go to step 3.

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Step	Action	Yes	No
3	1) With ignition switch OFF, disconnect “G39” connector. 2) Check proper connection at “G39-1” (“RED” wire) terminal. 3) If OK then ignition switch ON, and then check voltage from “G39-1” (“RED” wire) terminal on instrument panel harness to body ground. Is voltage 8 V or more?	Repair poor connection, high resistance in “RED” or “BLK/YEL” circuit of air bag harness or “AIR BAG” fuse.	Possibly faulty points are as follows. Check each of them and repair as necessary. • Circuit from battery to “G39” connector • Charging System (Refer to DIAGNOSIS in Section 6H)
4	1) With ignition switch OFF, reconnect SDM. With ignition switch ON, is DTC B1032 current?	Substitute a known-good SDM and recheck.	Check Charging System and repair as necessary. (Refer to DIAGNOSIS in Section 6H)

Fig. for STEP 2

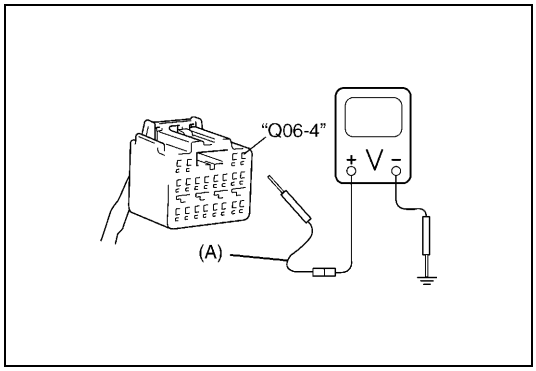
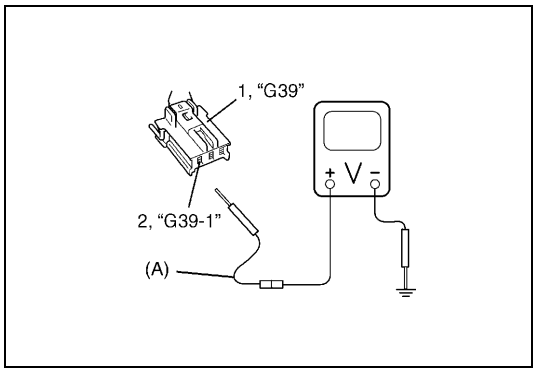


Fig. for STEP 3



1.	Instrument panel harness side connector
2.	“RED” wire terminal

Special tool
(A) : 09932-76010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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DTC B1041 – DRIVER PRETENSIONER INITIATOR CIRCUIT RESISTANCE HIGH

DTC B1042 – DRIVER PRETENSIONER INITIATOR CIRCUIT RESISTANCE LOW

DTC B1043 – DRIVER PRETENSIONER INITIATOR CIRCUIT SHORT TO GROUND

DTC B1044 – DRIVER PRETENSIONER INITIATOR CIRCUIT SHORT TO POWER CIRCUIT

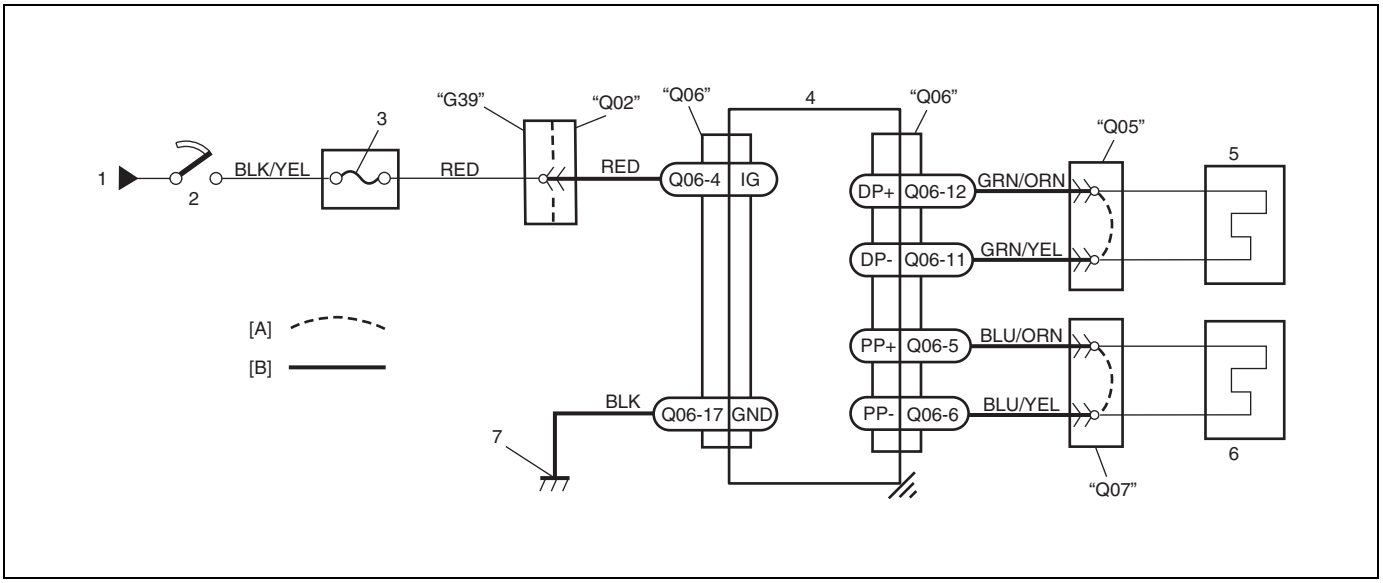
DTC B1045 – PASSENGER PRETENSIONER INITIATOR CIRCUIT RESISTANCE HIGH

DTC B1046 – PASSENGER PRETENSIONER INITIATOR CIRCUIT RESISTANCE LOW

DTC B1047 – PASSENGER PRETENSIONER INITIATOR CIRCUIT SHORT TO GROUND

DTC B1048 – PASSENGER PRETENSIONER INITIATOR CIRCUIT SHORT TO POWER CIRCUIT

WIRING DIAGRAM



[A] : Shorting bar	2. Ignition switch	5. Driver seat belt pretensioner
[B] : Air bag harness	3. "AIR BAG" fuse	6. Passenger seat belt pretensioner
1. From main fuse	4. SDM	7. Ground for air bag system

CAUTION:

- **Be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK before starting diagnosis according to flow table.**
- **When measurement of resistance or voltage is required in this table, use a tester along with a correct terminal adapter from special tool (Connector test adapter kit).**
- **When a check for proper connection is required, refer to INTERMITTENT AND POOR CONNECTIONS in this section.**
- **If there is open circuit in the air bag wire harness, connector or terminal is found damaged, replace the wire harness, connector and terminal as an assembly.**

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DTC WILL SET WHEN

DTC B1041 and B1045 :

The resistance of driver or passenger seat belt pretensioner initiator circuit is above a specified value for specified time.

DTC B1042 and B1046 :

The resistance of driver or passenger seat belt pretensioner initiator circuit is below a specified value for specified time.

DTC B1043 and B1047 :

The voltage measured at driver or passenger seat belt pretensioner initiator circuit is below a specified value for specified time.

DTC B1044 and B1048 :

The voltage measured at driver or passenger seat belt pretensioner initiator circuit is above a specified value for specified time.

TABLE TEST DESCRIPTION

DTC B1041, B1042, B1043, B1044, B1045, B1046, B1047 and B1048 :

STEP 1 : Check whether malfunction is in seat belt pretensioner.

STEP 2 : Check seat belt pretensioner initiator circuit in air bag harness.

DIAGNOSTIC FLOW TABLE

DTC B1041 and B1045 :

Step	Action	Yes	No
1	1) With ignition switch OFF, remove center pillar inner garnish of applicable side then disconnect seat belt pretensioner connector. 2) Check proper connection to applicable seat belt pretensioner at terminals in “Q05” or “Q07” connector. 3) If OK then connect Special Tool (B) to seat belt pretensioner connector disconnected at the step 1. With ignition switch ON, is DTC B1041 or B1045 still current?	Go to step 2.	Ignition switch OFF. Replace seat belt pretensioner (Refer to Section 10).
2	1) With ignition switch OFF, disconnect SDM. 2) Check proper connection to SDM at terminals “Q06-11” and “Q06-12” or “Q06-6” and “Q06-5”. 3) If OK then measure resistance between “Q06-11” and “Q06-12” terminals or “Q06-6” and “Q06-5” terminals with connected Special Tool (B). Is resistance 4.5 Ω or less?	Substitute a known-good SDM and recheck.	DTC B1041 : Repair high resistance or open in “GRN/ORN” or “GRN/YEL” wire circuit. DTC B1045 : Repair high resistance or open in “BLU/YEL” or “BLU/ORN” wire circuit.

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Fig. for STEP 1 and 2

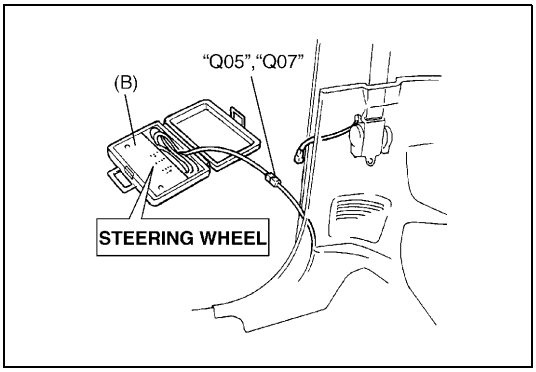
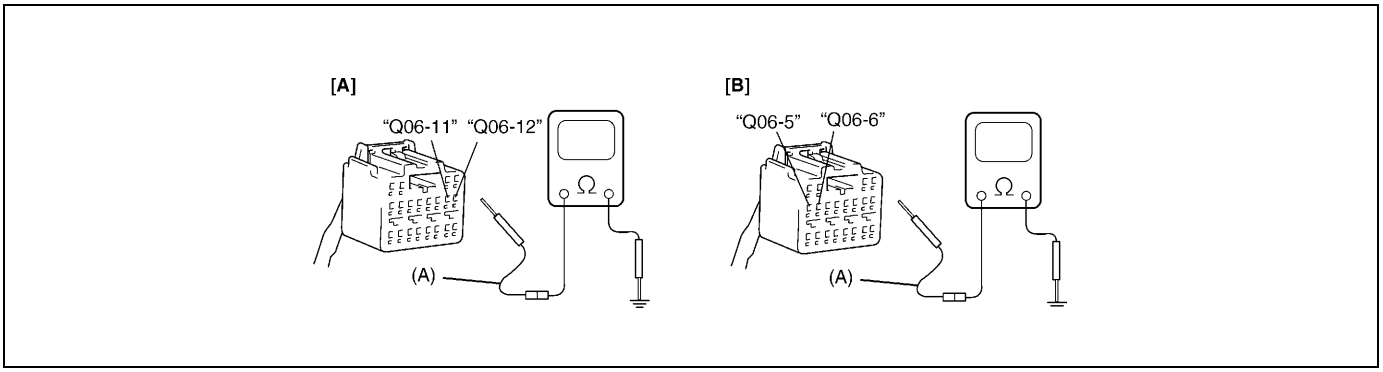


Fig. for STEP 2



[A] : For DTC B1041
[B] : For DTC B1045

Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

DTC B1042 and B1046 :

Step	Action	Yes	No
1	1) With ignition switch OFF, remove center pillar inner garnish of applicable side then disconnect seat belt pretensioner connector. 2) Check proper connection to applicable seat belt pretensioner at terminals in "Q05" or "Q07" connector. 3) If OK then connect Special Tool (B) to seat belt pretensioner connector disconnected at the step 1. With ignition switch ON, is DTC B1042 or B1046 still current?	Go to step 2.	Ignition switch OFF. Replace seat belt pretensioner (Refer to Section 10).

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Step	Action	Yes	No
2	1) With ignition switch OFF, disconnect SDM. 2) Check proper connection to SDM at terminals “Q06-11” and “Q06-12” or “Q06-6” and “Q06-5”. 3) If OK then measure resistance between “Q06-11” and “Q06-12” terminals or “Q06-06” and “Q06-05” terminals with connected Special Tool (B). Is resistance 1.4 Ω or more?	Substitute a known-good SDM and recheck.	DTC B1042 : Repair short from “GRN/ORN” wire circuit to “GRN/YEL” wire circuit or from “GRN/ORN” or “GRN/YEL” wire circuit to other wire circuit. DTC B1046 : Repair short from “BLU/YEL” wire circuit to “BLU/ORN” wire circuit or from “BLU/YEL” or “BLU/ORN” wire circuit to other wire circuit.

Fig. for STEP 1 and 2

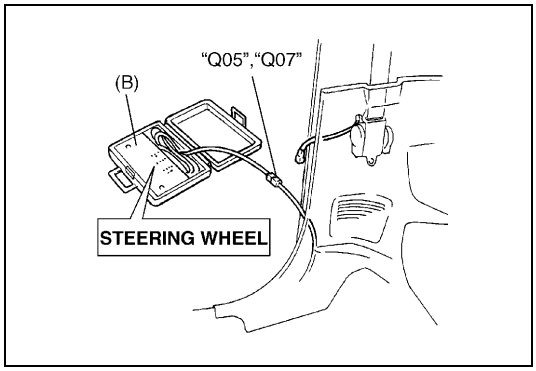
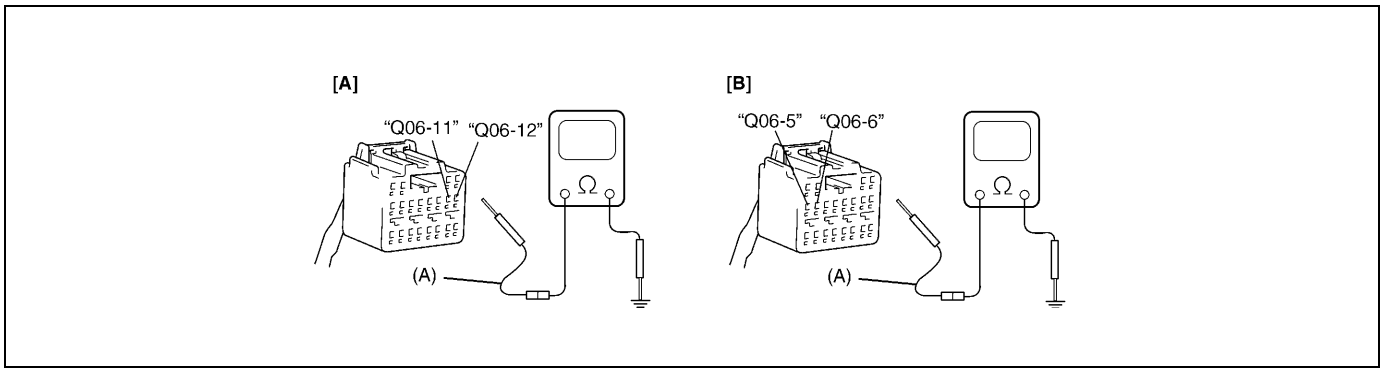


Fig. for STEP 2



[A] : For DTC B1042
[B] : For DTC B1046

Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

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DTC B1043 and B1047 :

Step	Action	Yes	No
1	1) With ignition switch OFF, remove center pillar inner garnish of applicable side then disconnect seat belt pretensioner connector. 2) Check proper connection to applicable seat belt pretensioner at terminals in “Q05” or “Q07” connector. 3) If OK then connect Special Tool (B) to seat belt pretensioner connector disconnected at the step 1. With ignition switch ON, is DTC B1043 or B1047 still current?	Go to step 2.	Ignition switch OFF. Replace seat belt pretensioner (Refer to Section 10).
2	1) With ignition switch OFF, disconnect Special Tool (B) and SDM. 2) Measure resistance between “Q06-11” or “Q06-6” and body ground. Is resistance 10 Ω or more?	Substitute a known-good SDM and recheck.	DTC B1043 : Repair short “GRN/YEL” or “GRN/ORN” wire circuit to ground. DTC B1047 : Repair short from “BLU/YEL” or “BLU/ORN” wire circuit to ground.

Fig. for STEP 1 and 2

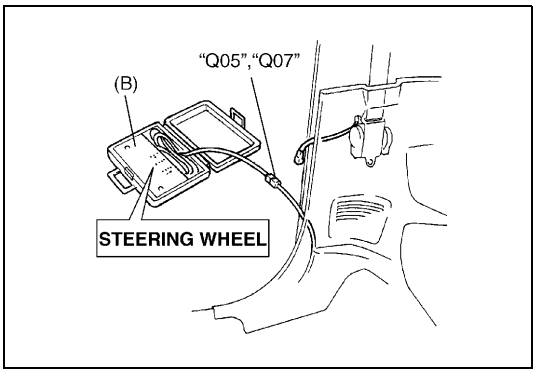
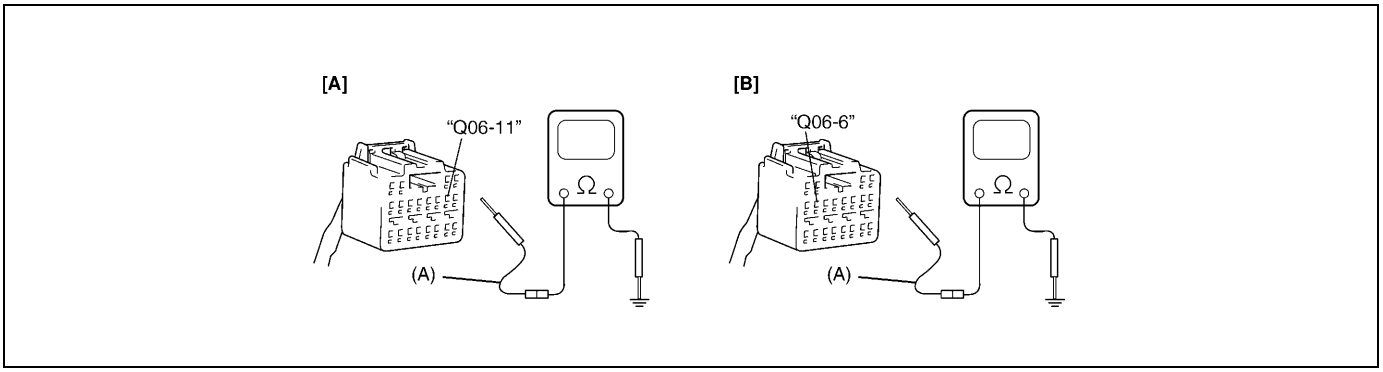


Fig. for STEP 2



[A] : For DTC B1043
[B] : For DTC B1047

Special tool
(A) : 09932-76010
(B) : 09932-75010

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NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

DTC B1044 and B1048 :

Step	Action	Yes	No
1	1) With ignition switch OFF, remove center pillar inner garnish of applicable side then disconnect seat belt pretensioner connector. 2) Check proper connection to applicable seat belt pretensioner at terminals in "Q05" or "Q07" connector. 3) If OK then connect Special Tool (B) to seat belt pretensioner connector disconnected at the step 1. With ignition switch ON, is DTC B1044 or B1048 still current?	Go to step 2.	Ignition switch OFF. Replace seat belt pretensioner (Refer to Section 10).
2	1) With ignition switch OFF, disconnect Special Tool (B) and SDM. 2) Measure voltage from "Q06-12" or "Q06-5" terminal to body ground. With ignition switch ON, is voltage 1 V or less?	Substitute a known-good SDM and recheck.	DTC B1044 : Repair short "GRN/ORN" or "GRN/YEL" wire circuit to power circuit. DTC B1048 : Repair short from "BLU/YEL" or "BLU/ORN" wire circuit to power circuit.

Fig. for STEP 1 and 2

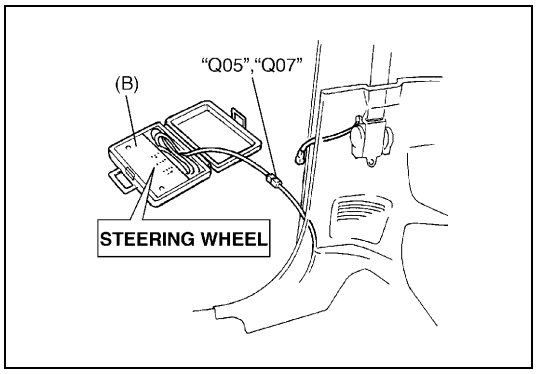

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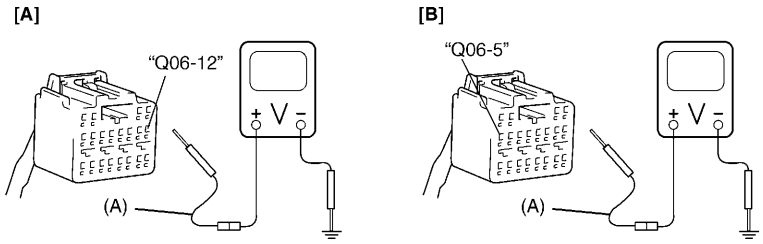
Fig. for STEP 2



[A] : For DTC B1044
[B] : For DTC B1048

Special tool
(A) : 09932-76010
(B) : 09932-75010

NOTE:

Upon completion of inspection and repair work, perform following items.
- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Clear diagnostic trouble codes (Refer to DTC CLEARANCE), if any.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

DTC B1051 – FRONTAL CRASH DETECTED (SYSTEM ACTIVATION COMMAND OUTPUTTED)

DTC WILL SET WHEN

The SDM detects a frontal crash of sufficient force to warrant activation of the air bag system. (SDM outputs a deployment command.)

TABLE TEST DESCRIPTION

STEP 1 : Check that DTC B1051 has been set although air bag has not been deployed.
STEP 2 : Check that DTC has been set due to failure of SDM.

NOTE:

Before executing items in this table, be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK.

Step	Action	Yes	No
1	1) Ignition switch OFF. Has air bag system deployed?	Replace components and perform inspections as directed in "REPAIRS AND INSPECTIONS REQUIRED AFTER AN ACCIDENT".	Go to step 2.

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Step	Action	Yes	No
2	1) Inspect front of vehicle and undercarriage for signs of impact. Are there signs of impact?	Replace components and perform inspections as directed in “REPAIRS AND INSPECTIONS REQUIRED AFTER AN ACCIDENT”.	Substitute a known-good SDM and recheck.

NOTE:

Upon completion of inspection and repair work, perform following items.

- **Reconnect all air bag system components, ensure all components are properly mounted.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK to confirm that the trouble has been corrected.**

DTC B1071 - INTERNAL SDM FAULT

DTC WILL SET WHEN

An internal SDM fault is detected by SDM.

NOTE:

Before executing items below, be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK.

NOTE:

DTC B1071 can never be cleared once it has been set.

- **Ignition switch OFF.**
- **Replace SDM.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK.**

DTC B1013 – SYSTEM SPECIFICATIONS DIFFERENT FROM SDM SPECIFICATIONS

DTC WILL SET WHEN

Specifications of the air bag system differ from those of SDM.

NOTE:

Before executing items below, be sure to perform AIR BAG DIAGNOSTIC SYSTEM CHECK.

- **Ignition switch OFF.**
- **Replace SDM.**
- **Repeat AIR BAG DIAGNOSTIC SYSTEM CHECK.**

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ON-VEHICLE SERVICE

SERVICE PRECAUTIONS

SERVICE AND DIAGNOSIS

WARNING/CAUTION labels are attached on each part of air bag system components (SDM, air bag (inflator) modules and seat belt pretensioners). Be sure to follow the instructions.

WARNING:

- **If the air bag system and another vehicle system both need repair, Suzuki recommends that the air bag system be repaired first, to help avoid unintended air bag system activation.**
- **Do not modify the steering wheel, dashboard or any other on or around air bag system components. Modifications can adversely affect air bag system performance and lead to injury.**
- **Failure to follow procedures could result in possible air bag system activation, personal injury or unneeded air bag system repairs.**

- Many of service procedures require disconnection of “AIR BAG” fuse and air bag (inflator) module(s) (driver and passenger) from initiator circuit to avoid an accidental deployment.
- Do not apply power to the air bag system unless all components are connected or a diagnostic chart requests it, as this will set a diagnostic trouble code (DTC).
- The “AIR BAG DIAGNOSTIC SYSTEM CHECK” must be the starting point of any air bag diagnostics. The “AIR BAG DIAGNOSTIC SYSTEM CHECK” will verify proper “AIR BAG” warning lamp operation and will lead you to the correct table to diagnose any air bag malfunctions. Bypassing these procedures may result in extended diagnostic time, incorrect diagnosis, and incorrect parts replacements.
- Never use air bag component parts from another vehicle.
- If the vehicle will be exposed to temperatures over 93°C (200°F) (for example, during a paint baking process), remove the air bag system components beforehand to avoid component damage or unintended system activation.
- When handling the air bag (inflator) modules (driver and passenger), seat belt pretensioners (driver and passenger) or SDM, be careful not to drop it or apply an impact to it. If an excessive impact was applied (e.g., SDM is dropped, air bag (inflator) module is dropped from a height of 90 cm (3 ft) or more, seat belt pretensioner (retractor assembly) is dropped from a height of 30 cm (1 ft) or more), never attempt disassembly or repair but replace it with a new one.
- When using electric welding, be sure to disconnect air bag (inflator) module connectors (driver and passenger) and seat belt pretensioner connectors (driver and passenger) respectively.
- When applying paint around the air bag system related parts, use care so that the harness or connector will not be exposed to the paint mist.
- Never expose air bag system component parts directly to hot air (drying or baking the vehicle after painting) or flames.

WARNING:

When performing service on or around air bag system components or air bag wiring, follow the procedures listed in the following pages to temporarily disable the air bag system.
Failure to follow procedures could result in possible air bag system activation, personal injury or unneeded air bag system repairs.

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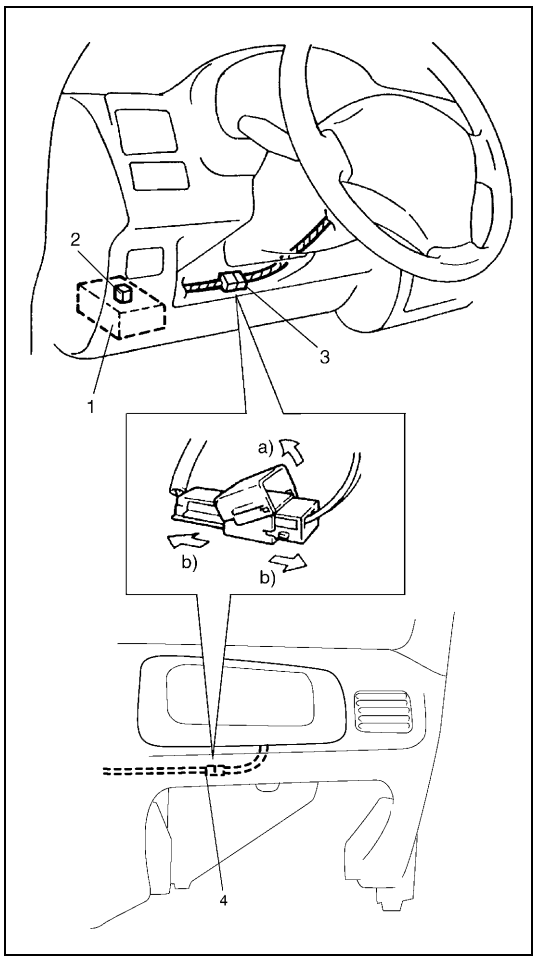
DISABLING AIR BAG SYSTEM

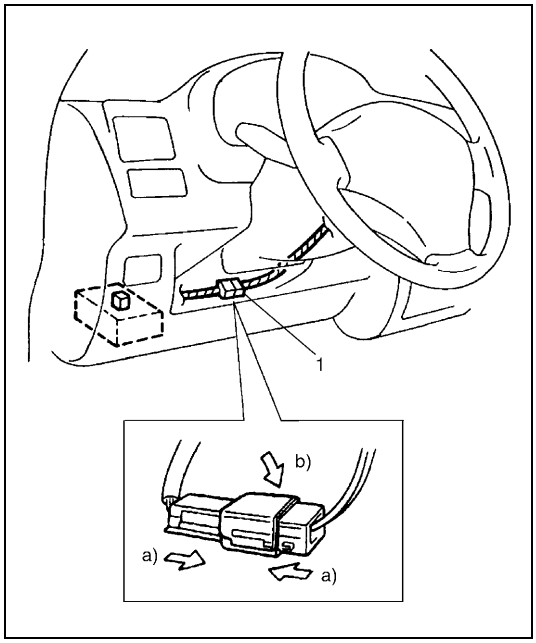


1) Turn steering wheel so that vehicle's wheels (front tires) and pointing straight ahead.
2) Turn ignition switch to “LOCK” position and remove key.
3) Remove “AIR BAG” fuse (2) from fuse box (1).
4) Disconnect Yellow connector (3) of contact coil and combination switch assembly.
   a) Release locking of lock lever.
   b) After unlocked, disconnect connector.
5) If equipped with passenger air bag (inflator) module, pull out glove box while pushing its stopper from both right and left sides and disconnect Yellow connector (4) of passenger air bag (inflator) module.
   a) Release locking of lock lever.
   b) After unlocked, disconnect connector.

NOTE:

With “AIR BAG” fuse removed and ignition switch ON, “AIR BAG” warning lamp will be ON.
This is normal operation and does not indicate a air bag system malfunction.

ENABLING AIR BAG SYSTEM



1) Turn ignition switch to “LOCK” position and remove key.
2) Connect Yellow connector (1) of contact coil and combination switch assembly, and be sure to lock connector with lock lever.
   a) Connect connector.
   b) Lock connector with lock lever.

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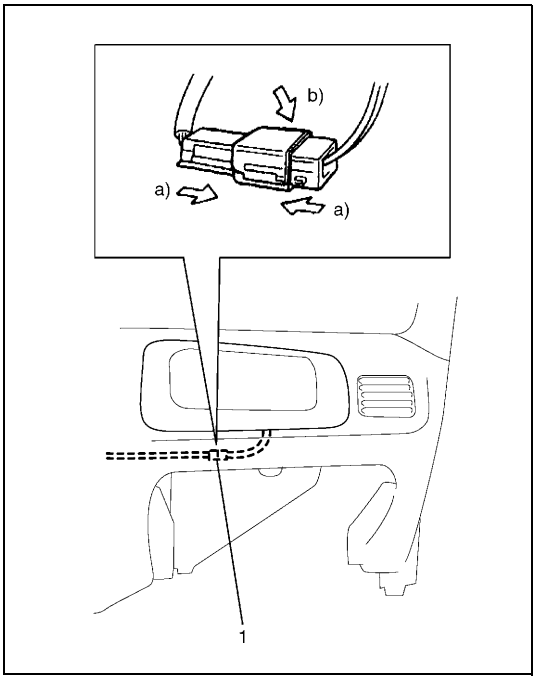
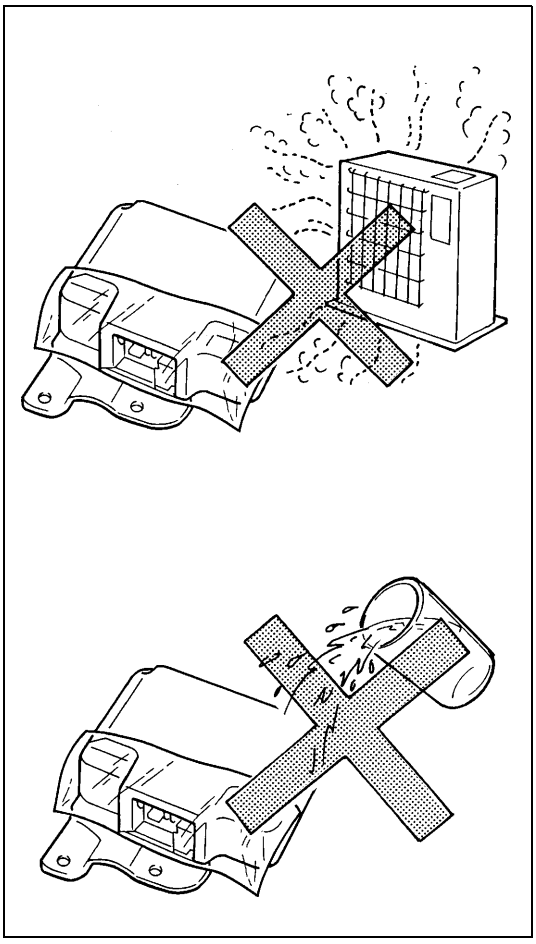


3) If equipped with passenger air bag (inflator) module, connect Yellow connector (1) of passenger air bag (inflator) module, and be sure to lock connector with lock lever.
   a) Connect connector.
   b) Lock connector with lock lever.
4) Install glove box.
5) Install “AIR BAG” fuse to fuse box.
6) Turn ignition switch to ON position and verify that “AIR BAG” warning lamp flashes 6 times and then turns OFF.
   If it does not operate as described, perform “AIR BAG DIAGNOSTIC SYSTEM CHECK”.

HANDLING AND STORAGE

SDM



WARNING:

Never power up air bag system when SDM is not rigidly attached to the vehicle. Otherwise, personal injury may result.

CAUTION:

After detecting one time of such collision as to meet deployment conditions, the SDM must not be used. Refer to “AIR BAG DIAGNOSTIC SYSTEM CHECK” when checking the SDM.

- Never attempt disassembly of SDM.
- When storing SDM, select a place where neither high temperature nor high humidity is anticipated and oil, water and dust are kept off.
- If SDM has been dropped, replace it with a new one.
- If installation part of SDM was damaged, repair that part completely before reinstallation.
- All SDM and mounting bracket fasteners must be carefully torqued and the arrow must be pointed toward the front of the vehicle to ensure proper operation of the air bag system.

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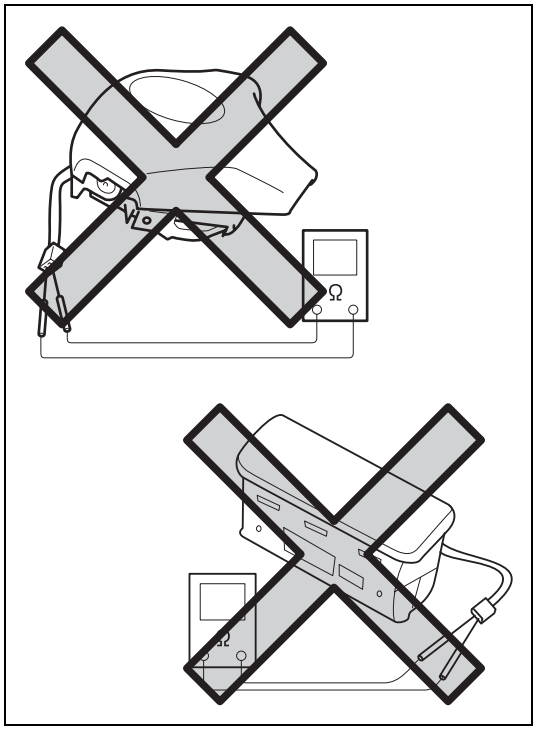
LIVE (UNDEPLOYED) AIR BAG (INFLATOR) MODULES

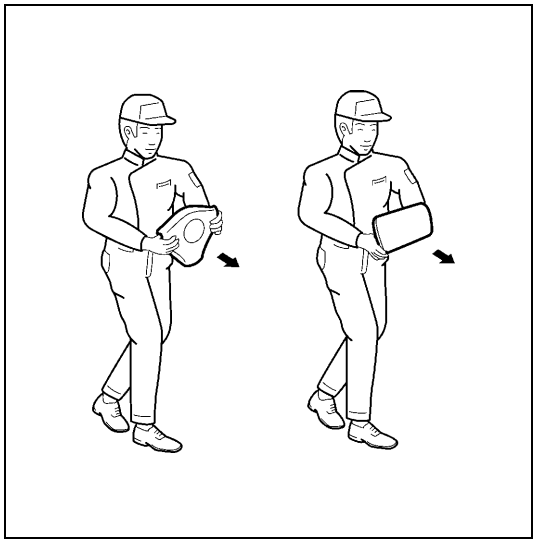
Special care is necessary when handling and storing a live (undeployed) air bag (inflator) modules.
The rapid gas generation produced during deployment of the air bag could cause the air bag (inflator) module, or an object in front of the air bag (inflator) module, to be thrown through the air in the unlikely event of an accidental deployment.



WARNING:

Never attempt to measure the resistance of the air bag (inflator) modules (driver and passenger). It is very dangerous as the electric current from the tester may deploy the air bag.

- Never attempt disassembly of the air bag (inflator) modules.
- If any abnormality is found, be sure to replace it with new one as an assembly.
- When an abnormality is noted as existing in the live (undeployed) air bag (inflator) module, be sure to deploy it before discarding it.
- When grease, cleaning agent, oil, water, etc., got on the air bag (inflator) modules (driver and passenger), wipe it off immediately with a dry cloth.
- If air bag (inflator) module was dropped from a height of 90 cm (3 ft) or more, it should be replaced with a new one as an assembly.



WARNING:

- **For handling and storage of a live air bag (inflator) module, select a place where the ambient temperature below 65°C (150°F), without high humidity and away from electric noise.**
- **When carrying a live air bag (inflator) module, make sure the bag opening is pointed away from you. In case of an accidental deployment, the bag will then deploy with minimal chance of injury. Never carry the air bag (inflator) module by the wires or connector on the underside of the module.**

Otherwise, personal injury may result.

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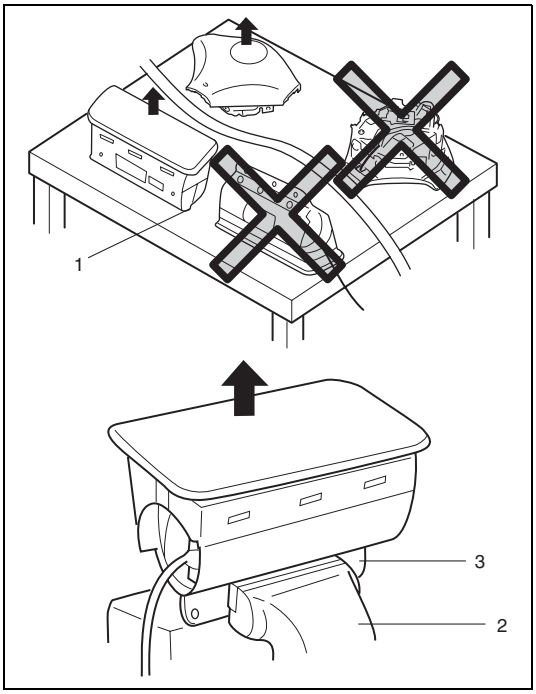
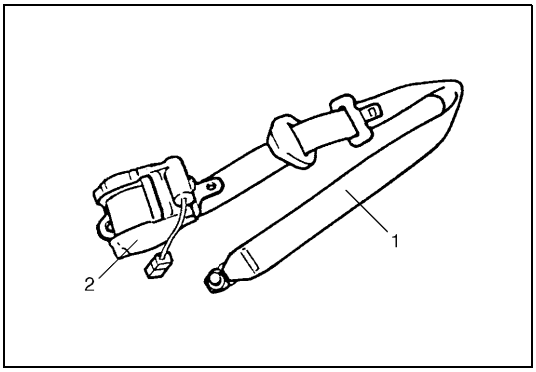


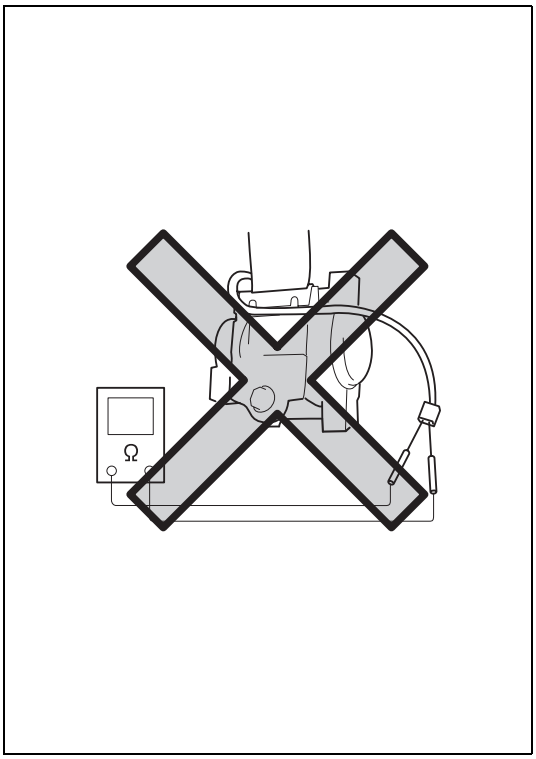
WARNING:

When placing a live air bag (inflator) module on bench or other surface, always face the bag up, away from the surface. As the live passenger air bag (inflator) module must be placed with its bag (trim cover) facing up, place it on the workbench with a slit (1) or use the workbench vise (2) to hold it securely at its lower mounting bracket (3).
It is also prohibited to place anything on top of the trim cover and stack air bag (inflator) modules.
This is necessary so that a free space is provided to allow the air bag to expand in the unlikely event of accidental deployment.
Otherwise, personal injury may result.

LIVE (INACTIVATED) SEAT BELT PRETENSIONER



Special care is necessary when handling and storing a live (inactivated) seat belt pretensioners.
Also, when the seat belt pretensioners activate, gas is generated and the seat belt (1) is retracted into the retractor assembly (2) quickly.
Note, therefore, that if they activate accidentally, the seat belt pretensioners and other object(s) around them may be thrown through the air.



WARNING:

Never attempt to measure the resistance of the seat belt pretensioners. It is very dangerous as the electric current from the tester may activate pretensioner.

- Never attempt to disassemble the seat belt pretensioners (retractor assembly).
- If any abnormality is found, be sure to replace it with new one as an assembly.
- When an abnormality is noted as existing in the live (inactivated) seat belt pretensioner, be sure to activate it before discarding it.
- When grease, cleaning agent oil, water, etc., got on the seat belt pretensioners (retractor assembly), wipe it off immediately with a dry cloth.
- If seat belt pretensioner was dropped from a height of 30 cm (1 ft) or more, it should be replaced with a new one as an assembly.

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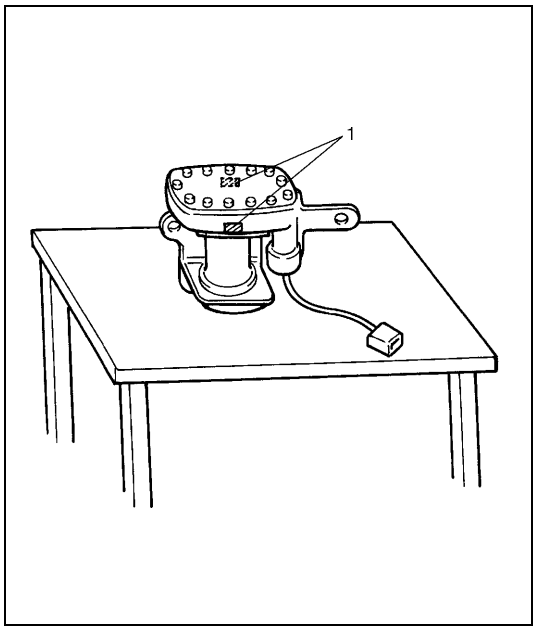

WARNING:

- **For handling and storage of a live seat belt pretensioner, select a place where the ambient temperature below 65°C (150°F), without high humidity and away from electric noise.**
- **Never carry the seat belt pretensioner by the wire or connector of the pretensioner.**
- **When placing a live seat belt pretensioner on the workbench or other surface, be sure not to lay it with its exhaust hole (1) provided side facing down. It is also prohibited to put something on its face with an exhaust hole (1) or to put a seat belt pretensioner on top of another.**

Otherwise, personal injury may result.

DEPLOYED AIR BAG (INFLATOR) MODULE AND ACTIVATED SEAT BELT PRETENSIONER

WARNING:

- **The air bag (inflator) module and seat belt pretensioner immediately after deployment/activation is very hot. Wait for at least 30 minutes to cool it off before proceeding the work.**
- **Do not apply water, oil, etc. to deployed air bag (inflator) module and to activate seat belt pretensioner.**
- **After an air bag (inflator) module has been deployed, the surface of the air bag may contain a powdery residue. This powder consists primarily of cornstarch (used to lubricate the bag as it inflates) and by-products of the chemical reaction. As with many service procedures, gloves and safety glasses should be worn.**
- **Wash your hands with mild soap and water after completing the work.**

Refer to the procedure described under “DEPLOYED AIR BAG (INFLATOR) MODULE AND ACTIVATED SEAT BELT PRETENSIONER DISPOSAL”.

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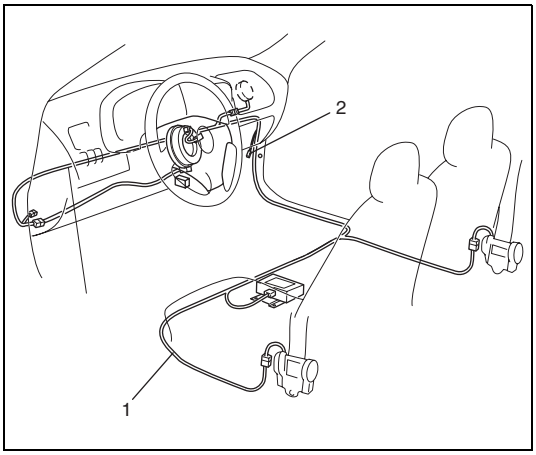

AIR BAG WIRE HARNESS AND CONNECTOR

Air bag wire harness (1) can be identified easily as it is covered with a yellow protection tube. Be very careful when handling it.

- When an open in air bag wire harness (1), damaged wire harness, connector or terminal is found, replace wire harness, connectors and terminals as an assembly.
- When installing it, be careful so that the air bag wire harness (1) is not caught or does not interfere with other parts.
- Make sure all air bag system grounding points (2) are clean and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

DISPOSAL

Do not dispose of the live (undeployed) air bag (inflator) modules and the live (inactivated) seat belt pretensioners. When disposal is necessary, be sure to deploy/activate the air bag and seat belt pretensioner according to deployment/activation procedure described in “AIR BAG (INFLATOR) MODULE AND SEAT BELT PRETENSIONER DISPOSAL”.

WARNING:

Failure to follow proper air bag (inflator) module and seat belt pretensioner disposal procedures can result in air bag deployment and pretensioner activation which could cause personal injury. Undeployed air bag (inflator) module and inactivated seat belt pretensioner must not be disposed of through normal refuse channels.

The undeployed air bag (inflator) module and inactivated seat belt pretensioner contain substances that can cause severe illness or personal injury if the sealed container is damaged during disposal.

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REPAIRS AND INSPECTIONS REQUIRED AFTER AN ACCIDENT

CAUTION:

- **All air bag system components, including the electrical harness (component mounting points), must be inspected after an accident. If any components are damaged or bent, they must be replaced even if air bag system activation did not occur.**
- **Never use air bag system parts from another vehicle.**
- **Do not attempt to service the parts below. Service of these parts is by replacement only.**
  - **– Driver/Passenger air bag (inflator) module, Driver/Passenger seat belt pretensioner**
  - **– SDM**
  - **– Contact coil and combination switch assembly**
  - **– Air bag wire harness**
- **Proper operation of the air bag system requires that any repairs to the vehicle structure return it to its original production configuration.**

CAUTION:

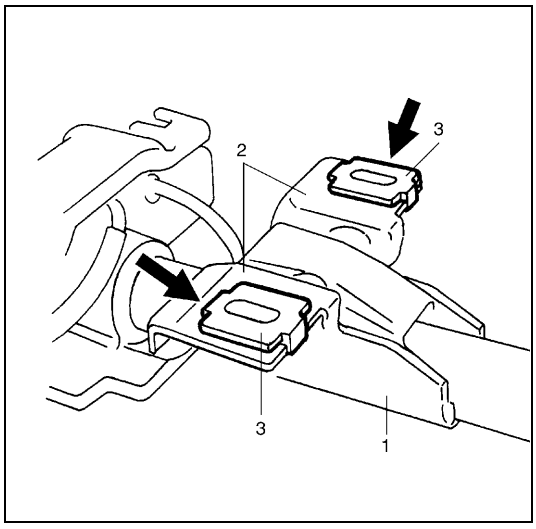
After detecting one time of such collision as to meet deployment conditions, the SDM must not be used. Refer to "AIR BAG DIAGNOSTIC SYSTEM CHECK" when checking the SDM.

ACCIDENT WITH DEPLOYMENT/ACTIVATION - COMPONENT REPLACEMENT

The following components must be replaced.

- Driver and passenger air bag (inflator) modules
- Driver and passenger seat belt pretensioners
- SDM
  - – Replace with new one as an assembly.

ACCIDENT WITH OR WITHOUT DEPLOYMENT/ACTIVATION - COMPONENT INSPECTIONS



Certain air bag system components must be inspected after any crash, whether the air bag system activated or not.

Those components are :

- Steering column (1) and shaft joints
  - – Check for length, damage and bend according to "CHECKING STEERING COLUMN FOR ACCIDENT DAMAGE" in SECTION 3C.

If any faulty condition is found in above checks, replace faulty part.

- Steering column bracket (2) and capsules (3)
  - – Check for damage and bent.

If any faulty condition is found in above checks, replace faulty part.

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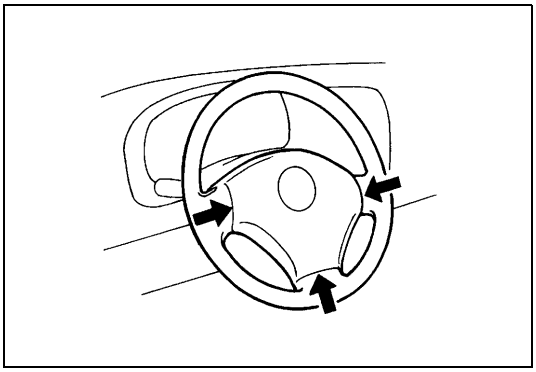
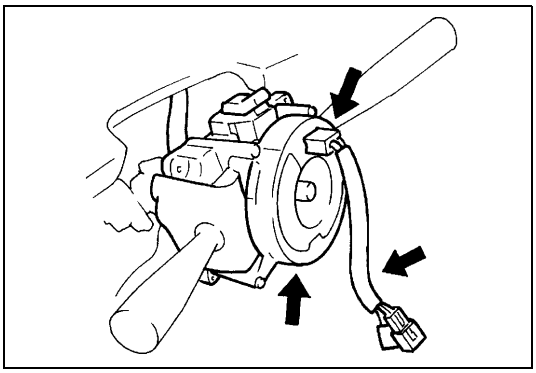


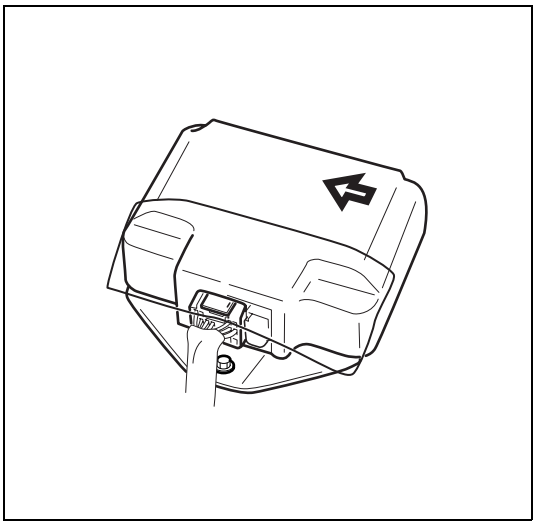
- Steering wheel and driver air bag (inflator) module
  - Check for damage or air bag (inflator) module fitness.
  - Check trim cover (pad surface) for cracks.
  - Check wire harness and connector for damage or tightness.

If any faulty condition is found in above checks, replace faulty part.



- Contact coil and combination switch assembly
  - Check wire harness and connectors for damage or tightness.
  - Check contact coil case for damage.

If any faulty condition is found in above checks, replace.

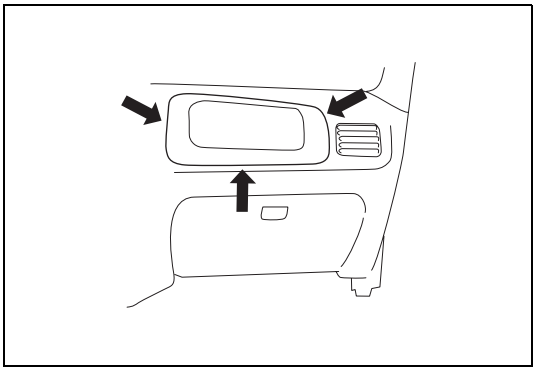


- SDM and SDM plate
  - Check for external damage such as deformation, scratch, crack, peeled paint, etc.
  - Check that SDM cannot be installed properly due to a cause in itself. (There is a gap between SDM and SDM plate, or it cannot be fixed securely.)
  - Check that connector or lead wire of SDM has a scorching, melting or damage.
  - Check SDM connector and terminals for tightness.
  - Check SDM sets a diagnostic trouble code (Refer to “DTC CHECK”.) and the diagnostic table leads to a malfunctioning SDM.

If any faulty condition is found in above checks, replace.

- Instrument panel member and reinforcement
  - Check for any distortion, bending, cracking or other damage.

If any faulty condition is found in above checks, replace.



- Passenger air bag (inflator) module
  - Check for dents, cracks, damage or fitness.
  - Check trim cover for cracks or deformities.
  - Check harness and connector for damage or tightness.

If any faulty condition is found in above checks, replace.

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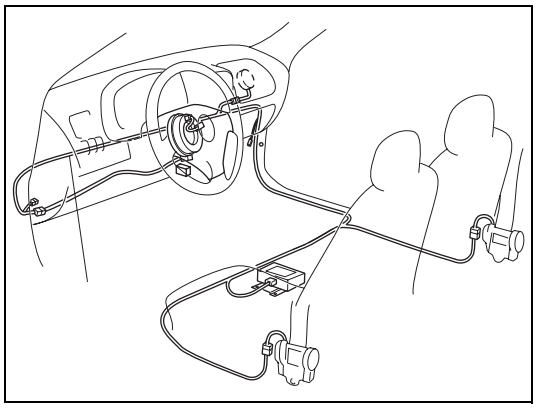
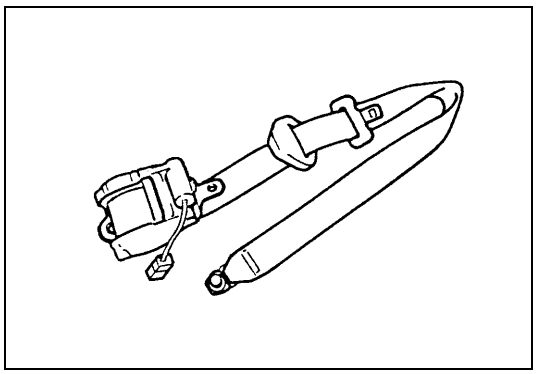


- Air bag wire harness and connections
  - Check for damages, deformities or poor connections. (Refer to “INTERMITTENTS AND POOR CONNECTIONS”.)
  - Check wire harness clamps for tightness.

If any faulty condition is found, correct or replace.



- Seat belt pretensioner
  - Check for dents, cracks, damage or fitness
  - Check harness and connector for damage or tightness.

If any faulty condition is found in above checks, replace.

- Seat belts and mounting points
  - Refer to “FRONT SEAT BELT WITH PRETENSIONER” in SECTION 10.
- “AIR BAG” warning lamp
  - After vehicle is completely repaired, perform “AIR BAG DIAGNOSTIC SYSTEM CHECK”.

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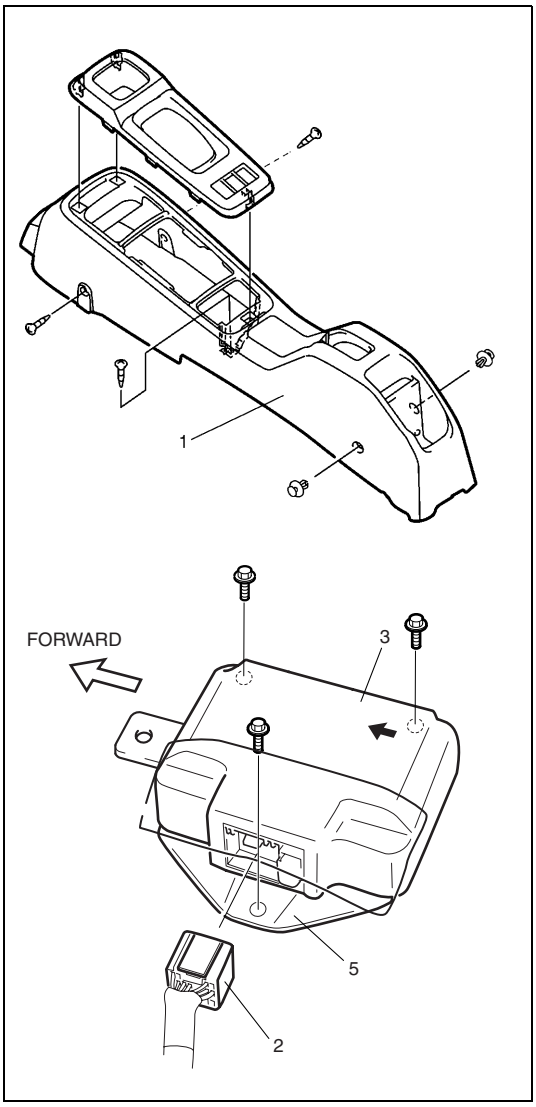
SDM

WARNING:

During service procedures, be very careful when handling a Sensing and Diagnostic Module (SDM).
Be sure to read "SERVICE PRECAUTIONS" before starting to work and observe every precaution during work. Neglecting them may result in personal injury or inactivation of the air bag system when necessary.

REMOVAL



1) Disconnect negative cable at battery.
2) Disable air bag system. Refer to "DISABLING AIR BAG SYSTEM" of "SERVICE PRECAUTIONS".
3) Remove center console boxes (1) by removing screws and clips.
4) Disconnect SDM connector (2) from SDM (3).
5) Remove SDM (3) (with SDM plate (5)) as an assembly from vehicle.

CAUTION:

Do not separate SDM (3) and SDM plate (5).

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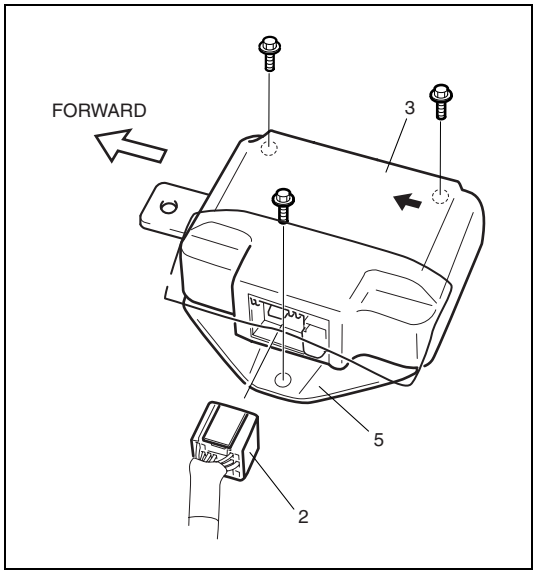
INSPECTION

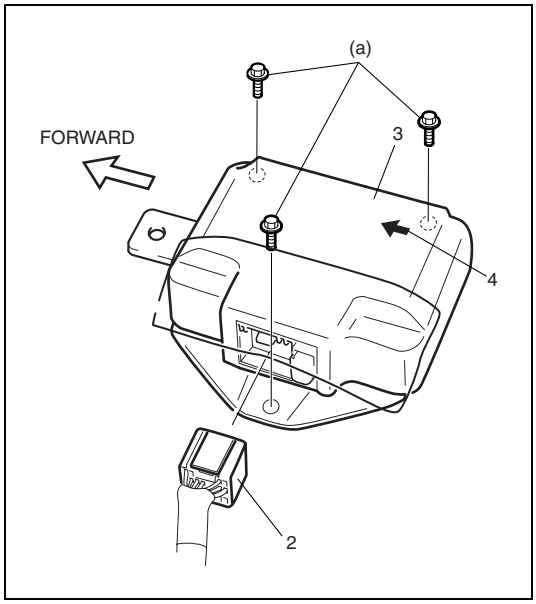


CAUTION:
- **Do not connect a tester whatever type it may be.**
- **Never repair or disassemble SDM (3).**
- **If SDM has been dropped, or if there are cracks, dents or other defects in the case or plate, replace it with a new one.**

- Check SDM (3) and SDM plate (5) for dents, cracks or deformation.
- Check SDM connector (2) for damage, cracks or lock mechanism.
- Check SDM terminal for bent, corrosion or rust.

If any faulty condition is found in above checks, replace.

INSTALLATION



For installation, reverse removal procedure, nothing following points.
- Ensure that arrow (4) on the SDM (3) is pointing toward the front of the vehicle.
- Tighten SDM bolts to specified torque.

Tightening torque
SDM mounting bolt (a) : 6 N·m (0.6 kg-m, 4.5 lb-ft)

- Connect SDM connector (2) to SDM (3) securely.
- Enable air bag system. Refer to “ENABLING AIR BAG SYSTEM”.

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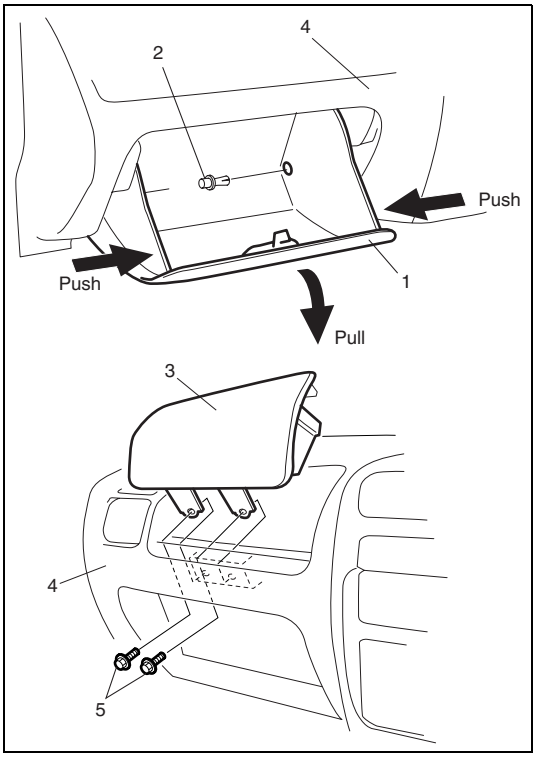
PASSENGER AIR BAG (INFLATOR) MODULE (IF EQUIPPED)

WARNING:

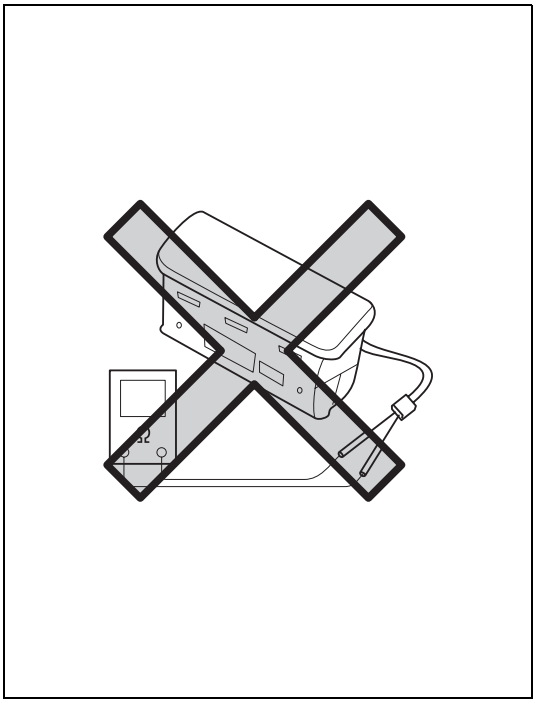
- **Never attempt to disassemble or repair the passenger air bag (inflator) module. If any abnormality is found, be sure to replace it with new one as an assembly.**
- **Be sure to read "SERVICE PRECAUTIONS" before starting to work and observe every precaution during work. Neglecting them may result in personal injury or undeployment of the air bag when necessary.**

REMOVAL



1) Disconnect negative cable at battery.
2) Open glove box (1), then while pressing glove box stopper, pull out glove box (1) from instrument panel (4) and then remove glove box clip (2) and glove box (1) from instrument panel (4).
3) Disable air bag system. Refer to "DISABLING AIR BAG SYSTEM".
4) Remove passenger air bag (inflator) module (3) attaching bolts (5) and passenger air bag (inflator) module (3) from vehicle.

INSPECTION



WARNING:

Never measure resistance of passenger air bag (inflator) module or disassemble it. Otherwise personal injury may result.

CAUTION:

If air bag (Inflator) module was dropped from a height or 90 cm (3 ft) or more, it should be replaced.

Check air bag (inflator) module appearance visually for following symptoms and if any one of them is applicable, replace with a new one.

- Air bag has deployed.
- There is a crack in trim cover (pad surface).
- Wire harness or connector is damaged.
- Air bag (inflator) module is damaged or a strong impact was applied to it.

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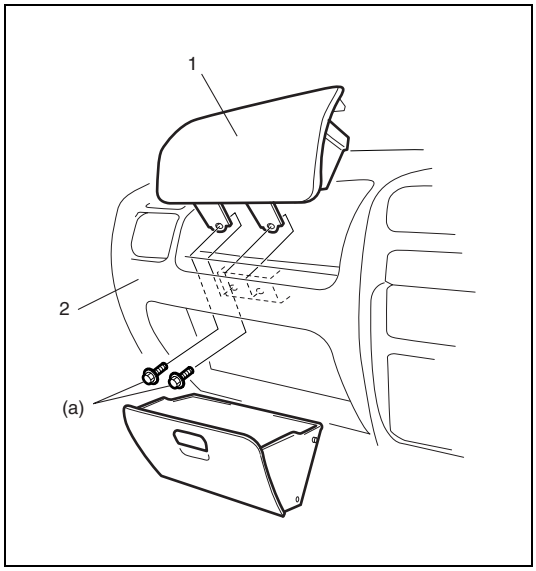

INSTALLATION

1) Install passenger air bag (inflator) module (1) to instrument panel (2).
2) Tighten passenger air bag (inflator) module attaching bolts to specified torque.

Tightening torque
Passenger air bag (inflator) module mounting bolt
(a) : 23 N·m (2.3 kg-m, 16.5 lb-ft)

3) Connect negative cable to battery.
4) Enable air bag system. Refer to “ENABLING AIR BAG SYSTEM”.

DRIVER AIR BAG (INFLATOR) MODULE

Refer to “DRIVER AIR BAG (INFLATOR) MODULE” in SECTION 3C for removal, inspection and installation.

CONTACT COIL AND COMBINATION SWITCH ASSEMBLY

Refer to “CONTACT COIL AND COMBINATION SWITCH ASSEMBLY” in SECTION 3C for removal, inspection and installation.

SEAT BELT PRETENSIONER (IF EQUIPPED)

Refer to “FRONT SEAT BELT WITH PRETENSIONER” in SECTION 10 for removal, inspection and installation.

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AIR BAG (INFLATOR) MODULE AND SEAT BELT PRETENSIONER DISPOSAL

WARNING:

Failure to follow proper air bag (inflator) module and seat belt pretensioner disposal procedures can result in air bag deployment and pretensioner activation which may cause personal injury.
Undeployed air bag (inflator) module/inactivated seat belt pretensioner must not be disposed of through normal refuse channels.
The undeployed air bag (inflator) module and inactivated seat belt pretensioner contain substances that can cause severe illness or personal injury if the sealed container is damaged during disposal.

Do not dispose of the live (undeployed) air bag (inflator) modules and seat belt pretensioners.
The method employed depends upon the final disposition of the particular vehicle, as noted in “DEPLOYMENT/ ACTIVATION OUTSIDE VEHICLE” and “DEPLOYMENT/ACTIVATION INSIDE VEHICLE”.

Deployment/Activation Outside Vehicle :
Follow this procedure when disposing of the air bag (inflator) module(s) and seat belt pretensioner(s) only (i.e., the vehicle itself will be used again).

Deployment/Activation Inside Vehicle :
Follow this procedure when scrapping the entire vehicle including the air bag (inflator) modules and seat belt pretensioners.

WARNING:

Following precautions must be observed for this work. Failure to observe any of them may result in personal injury.

- **The procedure should be followed strictly as described here.**
- **Be sure to read “SERVICE PRECAUTIONS” beforehand.**
- **To avoid an accidental deployment, this work should be performed by no more than one person.**
- **Since the smoke is produced when air bag is deployed and pretensioner is activated, select a well-ventilated area.**
- **The air bag (inflator) module and seat belt pretensioner will immediately deploy/activate when a power source is connected to it. Wear safety glasses throughout this entire deployment/activation and disposal procedure.**
- **Wear suitable ear protection when deploying air bag/activating pretensioner. Also, advise those who are in the area close to deployment/activation site to wear suitable ear protection.**
- **Do not deploy/activate two or more air bag system components (air bag (inflator) modules and seat belt pretensioners) at the same time.**
- **Never connect deployment harness to any power source before connecting deployment harness to the air bag (inflator) module and seat belt pretensioner. Deployment harness shall remain shorted and not be connected to a power source until the air bag is to be deployed and the pretensioner is to be activated.**

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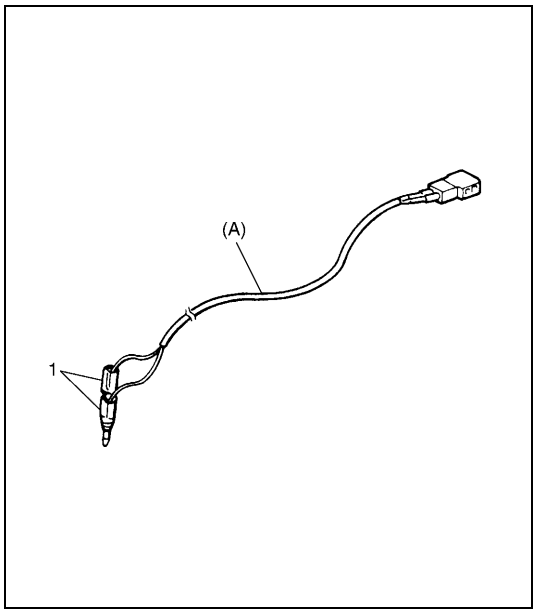
DEPLOYMENT/ACTIVATION OUTSIDE VEHICLE

Use this procedure when the vehicle itself is used again (only the air bag (inflator) module(s) and seat belt pretensioner(s) are disposed).

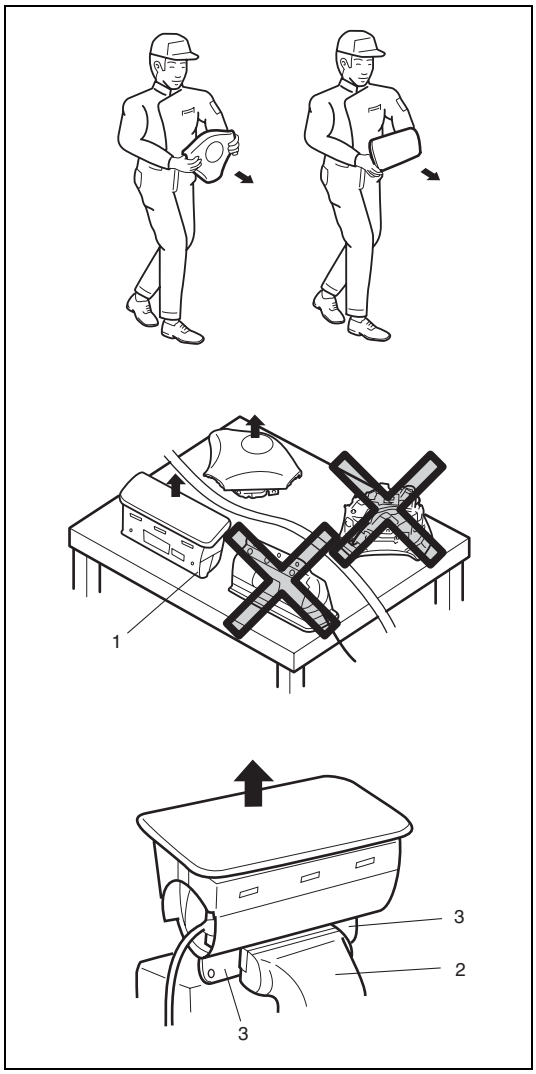


1) Turn ignition switch to “LOCK”, position remove key and put on safety glasses.
2) Check that there is no open, short or damage in special tool (deployment harness). If any faulty is found, do not use it and be sure to use new deployment harness.

Special tool
(A) : 09932-75030

3) Short (1) the two deployment harness leads together by fully seating one banana plug into the other.

WARNING:
Deployment harness shall remain shorted and not be connected to a power source until the air bag is to be deployed and seat belt pretensioner is to be activated.



4) Remove air bag (inflator) module(s) and seat belt pretensioner(s) from vehicle, referring to SECTION 3C, 10B and 10.

WARNING:
- **Always carry live air bag (inflator) module with trim cover away from you.**
- **When storing a live air bag (inflator) module or when leaving a live air bag (inflator) module unattended on a bench or other surface, always face the bag and trim cover up and away from the surface. As the live passenger air bag (inflator) module must be placed with its bag (trim cover) facing up, place it on the workbench with a slit (1) or use the workbench vise (2) to hold it securely at its lower mounting bracket (3).**
  This is necessary so that a free space is provided to allow the air bag to expand in the unlikely event of accidental deployment.

Failure to follow procedures may result in personal injury.

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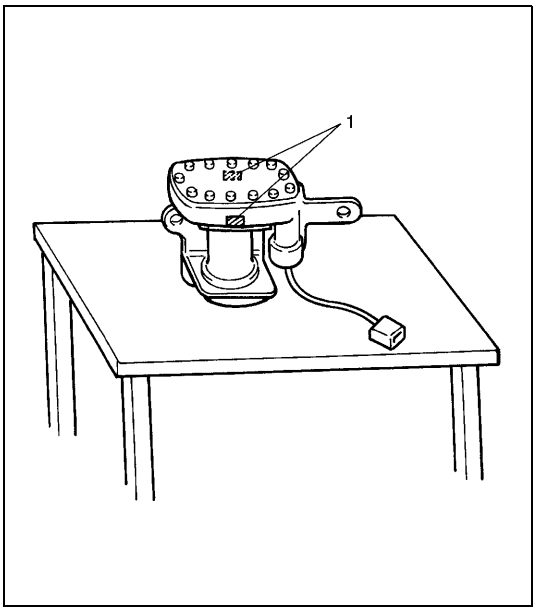
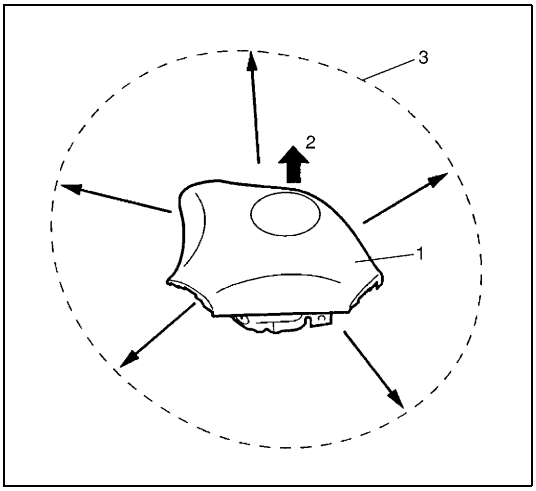


WARNING:

- **For handing and storage of a live seat belt pretensioner, select a place where the ambient temperature below 65°C (150°F), without high humidity and away from electric noise.**
- **Never carry the seat belt pretensioner by the wire or connector of the pretensioner.**
- **When placing a live seat belt pretensioner on the workbench or other surface, be sure not to lay it with its exhaust hole provided side facing down. It is also prohibited to put something on its face with an exhaust hole or to put a seat belt pretensioner on top of another.**

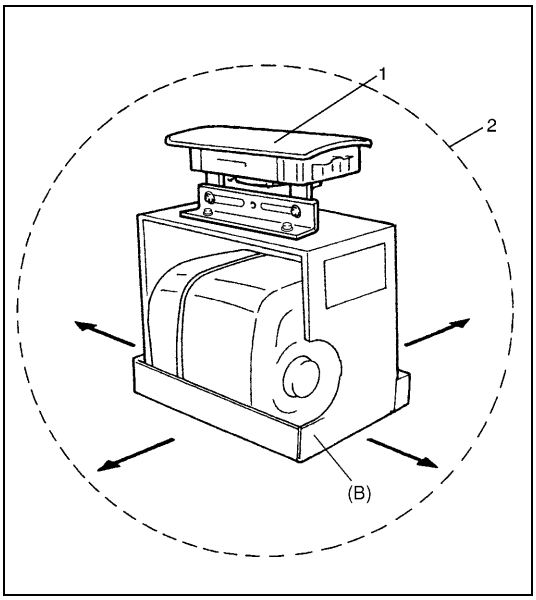
Otherwise, personal injury may result.

5) Set air bag (inflator) module or seat belt pretensioner as follows.



[In case of driver air bag (inflator) module]

a) Clear a space on the ground about 185 cm (6 ft) (3) in diameter where the driver air bag (inflator) module (1) is to be deployed. A paved, outdoor location where there is no activity is preferred. If an outdoor location is not available, a space on the shop floor where there is no activity and sufficient ventilation is recommended.
   Ensure no loose or flammable objects are within the deployment area.
b) Place the driver air bag (inflator) module (1), with its vinyl trim cover facing up (2), on the ground in the space just cleared.



[In case of passenger air bag (inflator) module]

a) Clear a space on the ground about 185 cm (6 ft) (2) in diameter where the fixture (special tool) with attached air bag (inflator) module (1) is to be placed for deployment. A paved outdoor location where there is no activity is preferred. If an outdoor location is not available, a space on the shop floor where there is no activity and sufficient ventilation is recommended. Ensure that no loose or flammable objects are within the deployment area.
b) Place special tool (passenger air bag (inflator) module deployment fixture) on the ground in the space cleared in step a), if it has not already been placed there.

Special tool
(B) : 09932-75041

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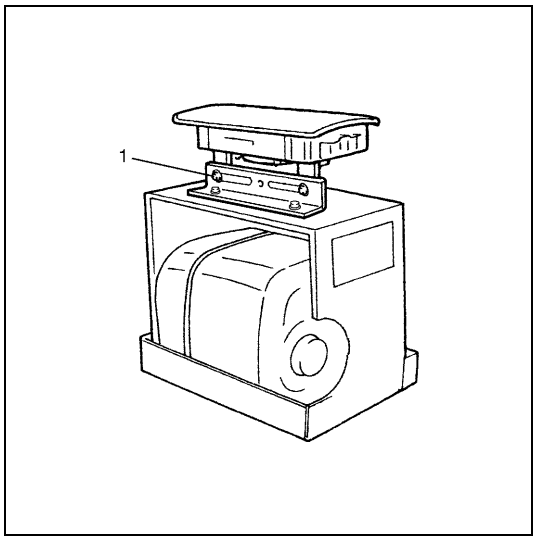
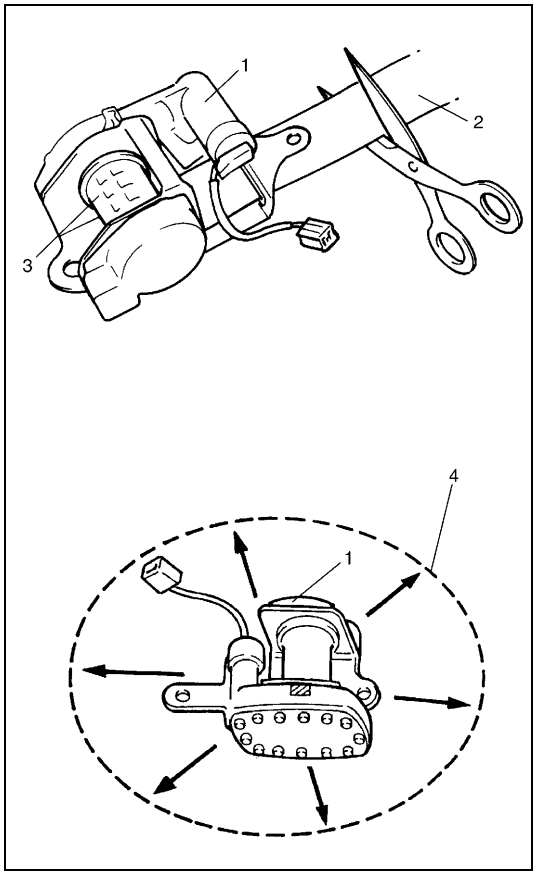


c) Fill plastic reservoir in fixture (special tool) with water or sand. This is necessary to provide sufficient stabilization of the fixture during deployment.
d) Attach the passenger air bag (inflator) module in the fixture (special tool) using mounting attachment, hold-down bolts and nuts and M8 bolts and nuts (3).

CAUTION:
Be sure to use the following bolt and nut for fixing passenger air bag (inflator) module to mounting attachment.
Size : M8, Strength : 7T

Securely hand-tighten all fastener prior to deployment.



[In case of seat belt pretensioner]
a) Pull out the webbing (2) fully as shown in the figure and cut it at the root of the pretensioner (retractor assembly) (1) as shown in the figure.

WARNING:
As the drum (3) of the retractor assembly (1) turns very quickly as soon as the webbing (2) is cut, fix the retractor assembly (1) with a vise on the workbench and keep your hands and fingers away from it when cutting the webbing (2).

b) Clear a space on the ground about 185 cm (6 ft) (4) in diameter where the seat belt pretensioner (retractor assembly) (1) is to be activated. A paved, outdoor location where there is no activity is preferred. If an outdoor location is not available, a space on the shop floor where there is no activity and sufficient ventilation is recommended.
Ensure no loose or flammable objects are within the activation area.
c) Place the seat belt pretensioner (retractor assembly) (1) as shown in the figure on the ground in the space just cleared.

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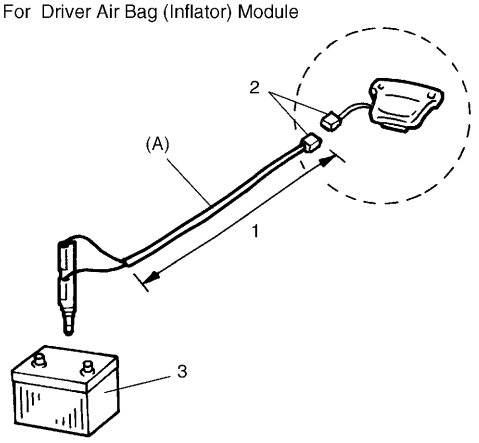
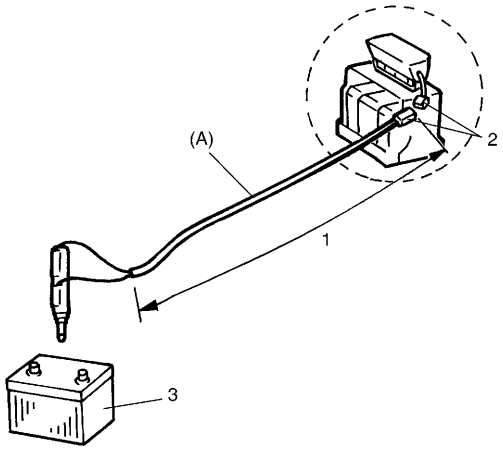
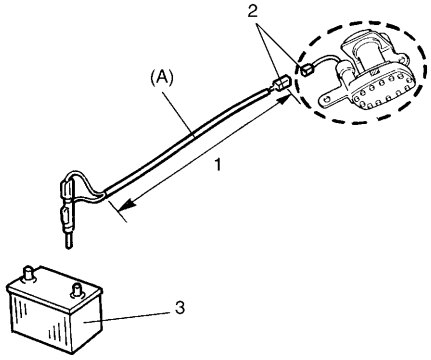
For Driver Air Bag (Inflator) Module



For Passenger Air Bag (Inflator) Module



For Seat Belt Pretensioner



6) Stretch the deployment harness from the driver or passenger air bag (inflator) module to its full length 10 m (33 ft) (1).

Special tool
(A) : 09932-75030

7) Place a power source (3) near the shorted end of the deployment harness. Recommended application: 12 Volts minimum, 2 amps minimum. A vehicle battery is suggested.
8) Verify that the area around the air bag (inflator) module or seat belt pretensioner is clear of all people and loose or flammable objects.
9) Verify setting condition of air bag (inflator) module or pretensioner as follows.
   [In case of driver air bag (inflater) module]
   Verify that the driver air bag (inflator) module is resting with its vinyl trim cover facing up.
   [In case of passenger air bag (inflator) module]
   Verify that the passenger air bag (inflator) module is firmly and properly secured in passenger air bag (inflator) module deployment fixture (special tool).
   [In case of seat belt pretensioner]
   Verify that the seat belt pretensioner, is placed as shown in the figure on the ground in the space just cleared.
10) Connect (2) the air bag (inflator) module or seat belt pretensioner to the deployment harness connector and lock connector with lock lever.
11) Notify all people in the immediate area that you intend to deploy/activate the air bag (inflator) module or seat belt pretensioner.

NOTE:

- **When the air bag deploys and the pretensioner activates, the rapid gas expansion will create a substantial report. Wear suitable ear protection. Notify all people in the immediate area that you intend to deploy the air bag (inflator) module or activate the seat belt pretensioner and suitable ear protection should be worn.**
- **When the driver air bag deploys and the pretensioner activates, driver air bag (inflator) module and pretensioner (retractor assembly) may jump about 30 cm (1 ft) vertically. This is a normal reaction of them to the force of the rapid gas expansion inside the air bag and pretensioner.**
- **After the air bag (inflator) module has been deployed, the surface of the air bag may contain a powdery residue. This powder consists primarily of cornstarch (used to lubricate the bag as it inflates) and by-products of the chemical reaction.**

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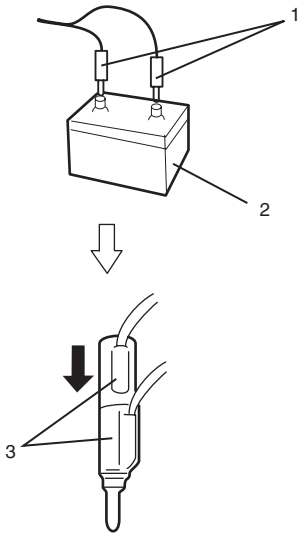
WARNING:

- **After deployment/activation, the metal surfaces of the air bag (inflator) module and the seat belt pretensioner will be very hot. Do not touch the metal areas of them for about 30 minutes after deployment/activation.**
- **Do not place the deployed air bag (inflator) module and the activated seat belt pretensioner near any flammable objects.**
- **Do not apply water, oil, etc. to deployed air bag (inflator) module and activated seat belt pretensioner.**
- **If the deployed air bag (inflator) module and the activated seat belt pretensioner must be moved before it is cool, wear gloves and handle it by using nonmetal material such as the air bag, webbing and vinyl trim.**

Failure to follow procedures may result in fire or personal injury.



12) Separate (1) the two banana plugs on the deployment harness.
13) Connect the deployment harness to the power source (12V vehicle battery) (2) to immediately deploy/activate the air bag or seat belt pretensioner.
14) Disconnect the deployment harness from power source (12V vehicle battery) (2) and short (3) the two deployment harness leads together by fully seating one banana plug into the other.
15) In the unlikely event that the air bag (inflator) module or seat belt pretensioner did not deploy/activate after following these procedures, proceed immediately with Steps 20) through 23). If the air bag (inflator) module or the seat belt pretensioner did deploy/activate, proceed with Steps 16) through 19).

16) Put on a pair of shop gloves to protect your hands from possible irritation and heat when handling the deployed air bag (inflator) module and the activated seat belt pretensioner.
17) Disconnect the deployment harness from the air bag (inflator) module and the seat belt pretensioner as soon after deployment/activation as possible.
    This will prevent damage to the deployment harness due to possible contact with the hot air bag (inflator) module and seat belt pretentioner. The deployment harness are designed to be reused. They should, however, be inspected for damage after each deployment/activation and replaced it if necessary.

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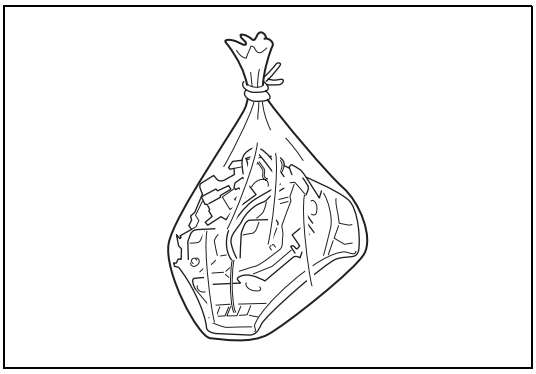

18) Dispose of the deployed air bag (inflator) module and the activated seat belt pretensioner through normal refuse channels after it has cooled for at least 10 minutes and tightly seal the air bag (inflator) module and the seat belt pretensioner in a strong vinyl bag. (Refer to “DEPLOYED AIR BAG (INFLATOR) MODULE AND ACTIVATED SEAT BELT PRETENSIONER DISPOSAL” in detail.)
19) Wash your hands with mild soap and water afterward.

NOTE:

The remaining steps are to be followed in the unlikely event that the air bag (inflator) module did not deploy or the seat belt pretensioner did not activate after following these procedures.

20) Ensure that the deployment harness has been disconnected from the power source and that its two banana plugs have been shorted together by fully seating one banana plug into the other.
21) Disconnect the deployment harness from the air bag (inflator) module and the seat belt pretensioner.
22) Temporarily store air bag (inflator) module or seat belt pretensioner.
    [For driver and passenger air bag (inflator) modules]
    Temporarily store the air bag (inflator) module with its vinyl trim cover facing up, away from the surface upon which it rests. Refer to “SERVICE PRECAUTIONS” for details.
    [For seat belt pretensioner]
    When temporarily strong the seat belt pretensioner, be sure NOT to face its exhaust hole provided side down. It must face up. Refer to “SERVICE PRECAUTIONS” for details.
23) Contact your local distributor for further assistance.

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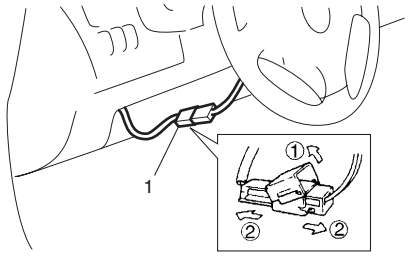
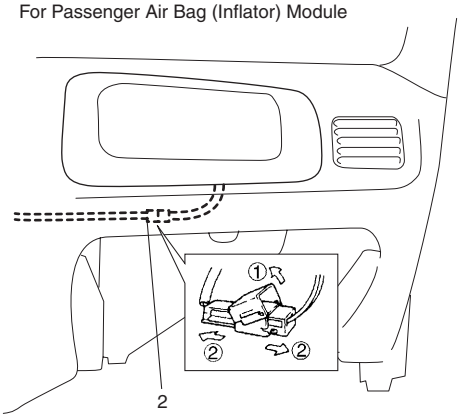
DEPLOYMENT/ACTIVATION INSIDE VEHICLE

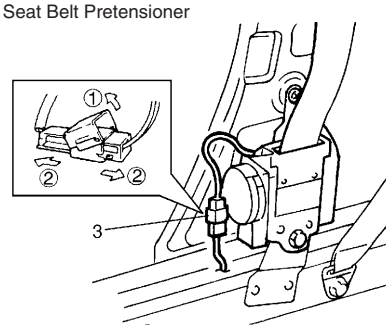
For Driver Air Bag (Inflator) Module



For Passenger Air Bag (Inflator) Module



For Seat Belt Pretensioner



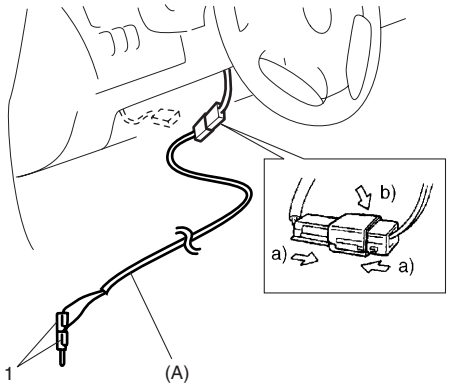
Use this procedure when scrapping the entire vehicle including the air bag (inflator) modules and seat belt pretensioners.

CAUTION:

When vehicle itself will be used again, deploy/activate the air bag and pretensioner outside vehicle according to "DEPLOYMENT/ACTIVATION OUTSIDE VEHICLE", for deploying/activating it inside will cause the instrument panel, glove box and their vicinity to be deformed. Failure to observe this CAUTION may require unneeded vehicle inspection and repair.

1) Turn ignition switch to "LOCK" position, remove key and put on safety glasses.
2) Remove all loose objects from front seats and instrument panel.
3) [For driver air bag (inflator) module]
   Disconnect contact coil connector (1) located near the base of the steering column.
   [For passenger air bag (inflator) module]
   Remove glove box from instrument panel and disconnect passenger air bag (inflator) module connector (2).
   [For seat belt pretensioner]
   Remove both side (driver and passenger side) center pillar lower trim and disconnect seat belt pretensioner connectors (3).
4) Confirm that each air bag (inflator) module is securely mounted.

For Driver Air Bag (inflator) Module



5) Check that there is no open, short or damage in special tool (deployment harness). If any faulty condition is found, do not use it and be sure to use new deployment harness.

   Special tool
   (A) : 09932-75030

6) Short (1) the two deployment harness leads together by fully seating one banana plug into the other.

WARNING:

Deployment harness shall remain shorted and not be connected to a power source until the air bag is to be deployed and seat belt pretensioner is to be activated.

7) Connect deployment harness connector to air bag (inflator) module (driver or passenger) or seat belt pretensioner (driver or passenger) and lock connector with lock lever.
   a) Connect connector.
   b) Lock connector with lock lever.

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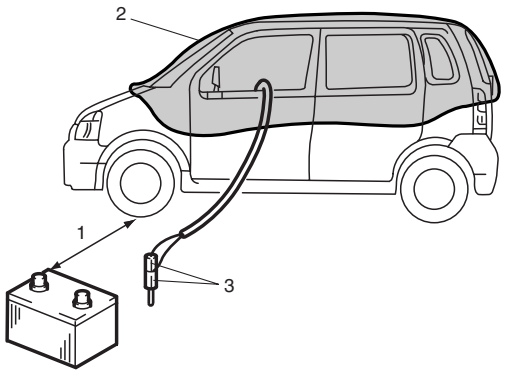
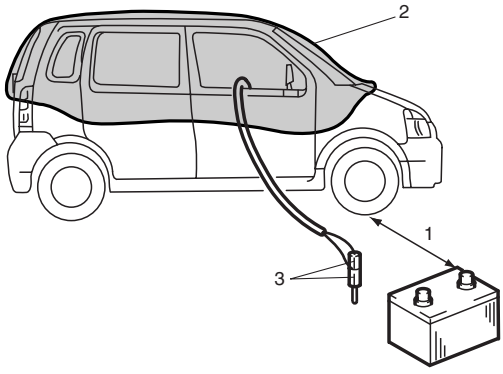
Driver side for left hand steering vehicle



Driver side for right hand steering vehicle



8) Route deployment harness out the vehicle.
9) Verify that the inside of the vehicle and the area surrounding the vehicle are clear of all people and loose or flammable objects.
10) Stretch the deployment harness to its full length 10 m (33 ft) (1).

Special tool
(A) : 09932-75030

11) Place a power source near the shorted end (3) of the deployment harness. Recommended application: 12 Volts minimum, 2 amps minimum. A vehicle battery is suggested.
12) Completely cover windshield area and front door window openings with a drop cloth, blanket to similar item (2). This reduces the possibility of injury due to possible fragmentation of the vehicle's glass or interior.
13) Notify all people in the immediate area that you intend to deploy the air bag (inflator) module or activate the seat belt pretensioner.

NOTE:

- **When the air bag deploys and the pretensioner activates, the rapid gas expansion will create a substantial report. Wear suitable ear protection. Notify all people in the immediate area that you intend to deploy the air bag (inflator) module or to activate the seat belt pretensioner and suitable ear protection should be worn.**
- **After the air bag (inflator) module has been deployed, the surface of the air bag may contain a powdery residue. This powder consists primarily of cornstarch (used to lubricate the bag as it inflates) and by-products of the chemical reaction.**

WARNING:

- **After deployment/activation, the metal surfaces of the air bag (inflator) module and the seat belt pretensioner will be very hot. Do not touch the metal areas of them for about 30 minutes after deployment/activation.**
- **Do not apply water, oil, etc. to deployed air bag (inflator) module and activated seat belt pretensioner. Failure to follow procedures may result in fire or personal injury.**

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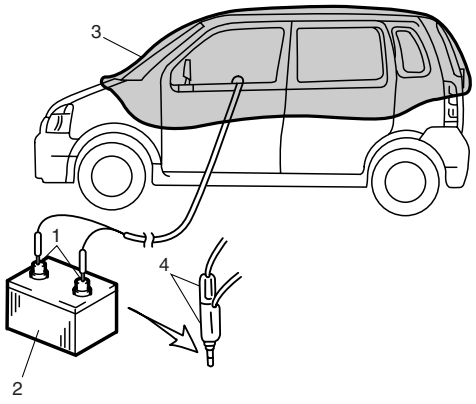

14) Separate the two banana plugs on the deployment harness.
15) Connect (1) the deployment harness to the power source (12 V vehicle battery) (2) to immediately deploy/activate the air bag or the pretensioner.
16) Disconnect the deployment harness from the power source (12 V vehicle battery) (2) and short (4) the two deployment harness leads together by fully seating one banana plug into the other.
17) Put on a pair of shop gloves to protect your hands from possible irritation and heat when handling the deployed air bag (inflator) module and the activated seat belt pretensioner.
18) Disconnect the deployment harness from the air bag (inflator) module and the seat belt pretensioner as soon after deployment/activation as possible.
    This will prevent damage to the deployment harness due to possible contact with the hot air bag (inflator) module and seat belt pretensioner. The deployment harness are designed to be reused. They should, however, be inspected for damage after each deployment/activation and replaced it if necessary.
19) Carefully remove drop cloth (3) from vehicle and clean off any fragments or discard it entirely.
20) Repeat Steps 2) through 19) to deploy/activate air bag (inflator) modules and seat belt pretensioners which has not been deployed/activated, if any.
21) In the unlikely event that the air bag (inflator) module and the seat belt pretensioner proceed immediately with Steps 23) through 25). If the air bag (inflator) module and the seat belt pretensioner did deploy/activate, proceed with Steps 22).

22) With air bags deployed and pretensioners activated the vehicle may be scrapped in the same manner as a non-air bag system equipped vehicle.
23) Remove the undeployed air bag (inflator) module(s) and the inactivated seat belt pretensioner(s) from the vehicle. For driver air bag (inflator) module refer to SECTION 3C, for passenger air bag (inflator) module refer to “ON-VEHICLE SERVICE”, for seat belt pretensioner refer to SECTION 10.
24) [For air bag (inflator) module]
    Temporarily store the air bag (inflator) module with its vinyl trim cover facing up, away from the surface upon which it rests. Refer to “SERVICE PRECAUTIONS” for details.
    [For seat belt pretensioner]
    When temporarily strong the seat belt pretensioner, be sure NOT to face its exhaust hole provided side down. It must face up. Refer to “SERVICE PRECAUTIONS” for details.
25) Contact your local distributor for further assistance.

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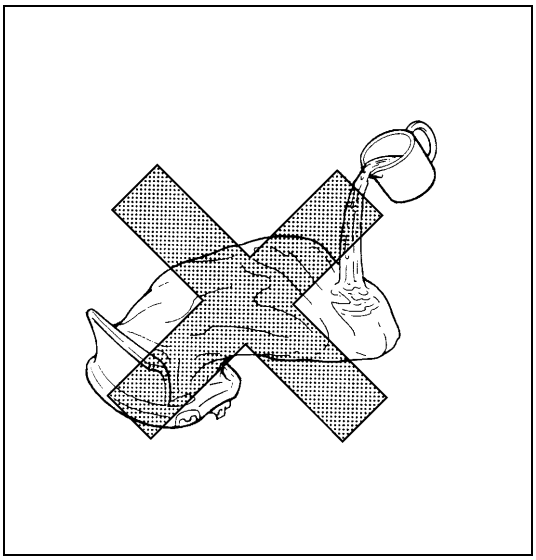
DEPLOYED AIR BAG (INFLATOR) MODULE AND ACTIVATED SEAT BELT PRETENSIONER DISPOSAL

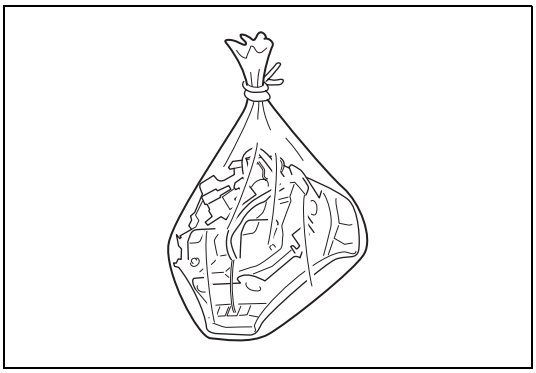
WARNING:

Failure to follow proper air bag (inflator) module and seat belt pretensioner disposal procedures can result in air bag deployment and pretensioner activation which may cause personal injury. The undeployed air bag (inflator) module and the inactivated seat belt pretensioner must not be disposed of through normal refuse channels.
The undeployed air bag (inflator) module and the inactivated seat belt pretensioner contains substances that can cause severe illness or personal injury if the sealed container is damaged during disposal.

Deployed air bag (inflator) module and the activated seat belt pretensioner can be disposed of through normal refuse channels just like any other parts. For their disposal, however, following points should be noted.



- The air bag (inflator) module and the seat belt pretensioner immediately after deployment/activation is very hot. Wait for 30 minutes to cool it off before handling it.
- Never apply water, oil, etc. to deployed air bag (inflator) module and the activated seat belt pretensioner to cool it off and be careful so that water, oil etc. does not get on the deployed air bag (inflator) module and the activated seat belt pretensioner.
- After the air bag (inflator) module has been deployed, the surface of the air bag may contain a powdery residue. This powder consists primarily of cornstarch (used to lubricate the bag as it inflates) and by-products of the chemical reaction. As with many service procedures, you should wear gloves and safety glasses.



- When disposing of the deployed air bag (inflator) module and the activated seat belt pretensioner, be sure to seal it in a vinyl bag.
- When air bag (inflator) module and seat belt pretensioner have been deployed/activated inside the vehicle which is going to be scrapped, leave them as installed to the vehicle.
- Be sure to wash your hands with mild soap and water after handling it.

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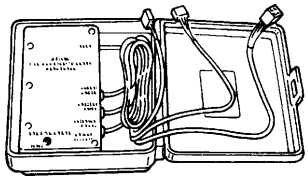
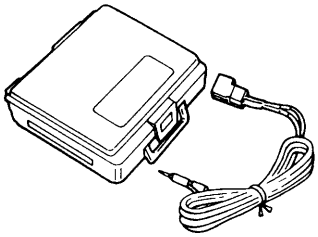
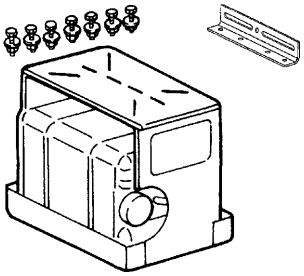
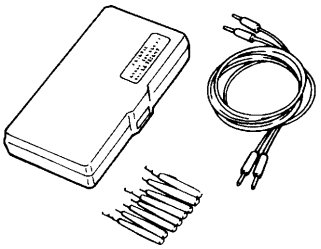
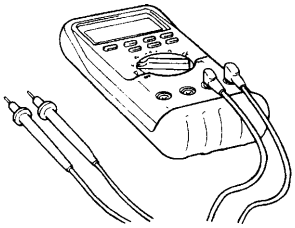
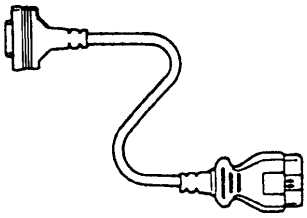
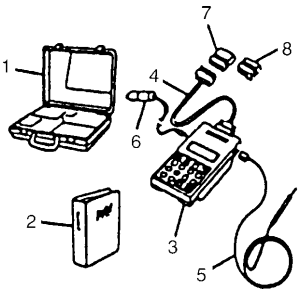
SPECIAL TOOL

 09932-75010 Air bag driver/passenger load tool	 09932-75030 Air bag deployment harness	 09932-75041 Passenger air bag (inflator) module deployment fixture	 09932-76010 Connector test adapter kit
 Digital multimeter (See NOTE “B” and WARNING.)	 09931-76030 16/14 pin DLC cable	 09931-76011 Tech 1A kit (See NOTE “A”.)	

WARNING:

Be sure to use the specified digital multimeter. Otherwise, air bag deployment or personal injury may result.

NOTE:

- **“A” : This kit includes the following items.**
  1. Storage case, 2. Operator’s manual, 3. Tech 1A, 4. DLC cable, 5. Test lead/probe, 6. Power 7. DLC cable adapter , 8. Self-test adapter
- **“B” : Digital multimeter specification : The maximum test current is 10 mA or less at the minimum range of resistance measurement.**

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